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PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, January 19th, 1922, at 8 p.m., SIR JAMES WALKER, D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death, of the following Fellows:

	Elected.	Died.
Giacomo Ciamician (Honorary Fellow) ...	March 2nd, 1911	
Ganesh Sakharan Agashe	June 15th, 1916	Dec. 2nd, 1921
James Albert Allison	Dec. 7th, 1905	Dec. 9th, 1921
Charles Edward Cassal	Feb. 6th, 1899	Dec. 22nd, 1921
William King	June 21st, 1917	Nov. 7th, 1921

The PRESIDENT announced:

(1) That in accordance with the Bye-laws the following vacant places fall due to be filled at the Annual General Meeting on March 30th, 1922:

Vice-Presidents who have filled the office of President .. .. Two vacancies.
Vice-Presidents who have not filled the office of President .. .. Two vacancies.
Secretary .. .. One vacancy.
Ordinary Members of Council:
(*a*) Town Members (that is, those living within a radius of 50 miles from London) Three vacancies.
(*b*) Country Members (that is, those living beyond a radius of 50 miles of London) Three vacancies.

The Council has nominated Dr. Irvine Masson to the office of Secretary.

The names of the Members of Council who retire at the Annual General Meeting on March 30th, 1922, and who are ineligible for re-election to the same office until the lapse of one year, are as follows:

Vice-Presidents who have filled the office of President:

Sir James J. Dobbie and Sir William J. Pope.

Vice-Presidents who have not filled the office of President:

Professor J. B. Cohen and Dr. H. J. H. Fenton.

Ordinary Members of Council:

(*a*) Town Members:

Mr. J. A. Gardner, Dr. C. A. Keane, and Sir Robert Robertson.

(*b*) Country Members:

Dr. E. F. Armstrong, Professor F. E. Francis, and Principal J. C. Irvine.

(2) That arrangements have been made with the Society of Chemical Industry whereby provincial Local Sections of that Society may give opportunity to Fellows of the Chemical Society to read papers on pure chemistry and to attend the meetings at which such papers are read. Further information in regard to the scheme will be circulated at an early date.

(3) That a pamphlet entitled "Notes on the Furnishing and Equipment of Chemical Laboratories" has just been issued by the Society. Arising from a Conference held in July, 1920, to consider whether economies could be effected in the equipment of chemical laboratories, a small Committee was appointed by the Council to look into and report upon the matter. These "Notes" represent the results of the inquiry and can be obtained free of charge on application to the Assistant Secretary.

Certificates were read for the first time in favour of:

Jnanendra Kumar Adhya, M.Sc., 30, Judge's Court Road, Alipore, Calcutta.
Gilbert James Avey, Northern Polytechnic Institute, Holloway, N. 7.
Bhagwan Das Batta, B.Sc., F. C. College, Lahore, India.
Darrell Webb Beesley, A.I.C., 29, King Edward Road, Dentons Green, St. Helens.
William Alfred Bishop, B.A., 33, Banstead Road, Purley.
Leslie James Burrage, B.Sc., 32, Emerson Road, Ilford.
Gabriel Cofman-Nicoresti, 15, Ludlow Road, Ealing, W. 5.
Archibald Neil Currie, M.A., B.Sc., A.I.C., 44, Fisher Street, Dennistoun, Glasgow.
James Owen Chesshyre Dalton, B.A., The Plot, Adams Road, Cambridge.
Arthur William Edwards, 4, Dunvegan Road, Eltham, S.E. 9.
Samuel Ellingworth, M.Sc., 74, Millfield Road, York.
Kenneth Fisher, M.A., Ph.D., Eton College, Windsor.
Miri Lal Goel, M.Sc., Royal Artillery Bazar, Ambala, India.
George Grimshaw Hammond, B.Sc., 254, Mill Street, Toxteth, Liverpool.
William Allen Hamor, M.A., Mellon Institute of Industrial Research, The University, Pittsburg, Pa., U.S.A.
Frank Mouat Irvine, B.Sc., A.I.C., 30, Clayton Road, Jesmond, Newcastle on-Tyne.

John Albert Jenkinson, B.Sc., School House, Little Sutton, Birkenhead.
Rowland Nicholas Johnson, B.Sc., Greenstede, West Hill, East Grinstead.
David John Lake, B.Sc., 36, Gerald Street, Hafod, Swansea.
Herbert Langwell, Wentworth, Denham Road, Epsom.
Vernon Howes Legg, B.Sc., 95, Carter Knowle Road, Sheffield.
John Alexander McRae, M.A., Ph.D., F.I.C., Queen's University, Kingston, Ont., Canada.
Walter Thomas James Morgan, 171, Kensington Avenue, Manor Park, E. 12.
John Sydney Morrison, 23, Seymour Road, Cheadle Hulme, Manchester.
Partridge Leslie Podd, B.Sc., 8, St. Peter's Street, Ipswich.
Krishnarajpet Venkata Rau, B.A., B.Sc., Ananda College, Colombo, Ceylon.
Frank Crafer Ray, B.A., 47, Alfriston Road, Clapham Common, S.W. 11.
Jessie Stewart, B.Sc., School House, Helmington Row, Crook, Co. Durham.
George Taylor, Frigorifico, Campana F.C.C.A., Argentine.
James Rawson Walmsley, A.I.C., Dean Brook Cottage, Dean Lane, Moston, Manchester.
Walter Arthur White, 144, Shelley Avenue, Manor Park, E. 12.
Robert Norman Wright, B.Sc., A.I.C., 16, Redcliffe Street, S. Kensington, S.W. 10.

Prof. A. SMITHELLS then gave an account of the Lewis-Langmuir theory of atomic structure, the exposition being illustrated with a large number of models. On the motion of Prof. Sir W. H. Bragg, supported by Prof. Lowry and the President, a cordial vote of thanks to the lecturer was passed with acclamation, and Prof. Smithells made suitable acknowledgment.

ORDINARY SCIENTIFIC MEETING.

The next Ordinary Scientific Meeting will be held on Thursday, February 2nd, 1922, at 8 p.m.

LECTURE.

At the Ordinary Scientific Meeting to be held on Thursday, February 9th, 1922, at 8 p.m., in the Lecture Hall of the Institution of Mechanical Engineers, Storey's Gate, S.W.1., Sir Ernest Rutherford, M.A., D.Sc., F.R.S., will deliver his Lecture, entitled "Artificial Disintegration of Elements."

SETS OF THE BERICHTE AND OF THE ZENTRALBLATT.

The Council has secured a few sets of the *Berichte* and of the *Zentralblatt* from August, 1914, to December, 1920, inclusive. These can be obtained, *in complete sets only*, from the Assistant Secretary, price £10 a set of the *Berichte*, or of the *Zentralblatt*.

The number of sets is strictly limited, and applications will be dealt with in the order in which they are received.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

DEUTSCHE CHEMISCHE GESELLSCHAFT. Chemisches Zentralblatt. Generalregister IV, über die Jahrgänge 1912–1916. Edited by IGNAZ BLOCH. Leipzig 1921. pp. vi + 2016. (*Reference.*)
From the Deutsche Chemische Gesellschaft.

FÉDÉRATION DES INDUSTRIES CHIMIQUES DE BELGIQUE. Bulletin. Vol. I., etc. Gand 1921 +. [Issued with the *Bull Soc. Chim. Belg.*] (*Reference.*)
From the Société Chimique de Belgique.

FOURNEAU, ERNEST. Préparation des médicaments organiques. Paris 1921. pp. viii + 350. 25 *fr.* (*Recd.* 13/12/21.)
From the Author.

PARKES, SAMUEL. The rudiments of chemistry; illustrated by experiments, and eight copper-plate engravings of chemical apparatus. London 1810. pp. xii + 294. ill. (*Reference.*)
From Mr. W. Livingstone Gunn.

II. *By Purchase.*

FISCHER, FERDINAND. Kraftgas: Theorie und Praxis der Vergasung fester Brennstoffe. (*Chem. Tech. in Einzeldarstellungen.*) 2nd edition. Edited by J. GWOSDZ. Leipzig 1921. pp. viii + 428. ill. (*Recd.* 21/12/21.)

MINISTRY OF MUNITIONS and DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH. Technical records of explosives supply. 1915–1918. No. IV. The theory and practice of acid mixing. London 1921. pp. vi + 94. ill. 12*s.* net. (*Recd.* 8/12/21.)

VANINO, LUDWIG. Handbuch der präparativen Chemie. 2nd edition. Vol. I. Anorganischer Teil. Stuttgart 1921. pp. xxiv + 821. ill. (*Recd.* 13/12/21.)

III. *Pamphlets.*

MEES, CHARLES EDWARD KENNETH, and CLARKE, HANS THATCHER. The preparation of synthetic organic chemicals at Rochester. [A lecture delivered before the Society of Chemical Industry, Montreal, August 31, 1921.] Rochester, N.Y. 1921. pp. 40. ill.

MOIR, JAMES. (1) The permanganate absorption-spectrum: a claim for priority. (2) A formula for calculating the uranium spectrum. (From the *Trans. Roy. Soc. S. Africa*, 1921, **10**.)

SCIENTIFIC AND INDUSTRIAL RESEARCH, DEPARTMENT OF. Bulletin No. 5. The cleaning and restoration of museum exhibits: report upon investigations conducted at the British Museum. London 1921. pp. 12. ill.

—— First report of the Gas Cylinders Research Committee. London 1921. pp. 126. ill.

—— *Food Investigation Board.* Special Report No. 5. Report on heat insulators by the Engineering Committee of the Food Investigation Board. Experiments by EZER GRIFFITHS. London 1921. pp. 61. ill.

—— *Fuel Research Board.* Technical Paper No. 3. The efficiency of low temperature coke in domestic appliances. By MARGARET WHITE FISHENDEN. London 1921. pp. 35. ill.

WRIGHT, ALLISTER MACLEAN. The anticomplementary properties observed in certain serum reactions. (From the *Trans. New Zealand Inst.*, 1921, **53**.)

WRIGHT, ALLISTER MACLEAN, BEVIS, MISS J. F., and the late PERCY S. NELSON. The chemistry of flesh foods. No. 5. The nitrogenous constituents of meat-extracts. (From the *Trans. New Zealand Inst.*; 1921, **53**.)

CERTIFICATES OF CANDIDATES FOR ELECTION AT THE BALLOT TO BE HELD AT THE ORDINARY SCIENTIFIC MEETING ON THURSDAY, FEBRUARY 16TH, 1922.

N.B.—The names of those who sign from "General Knowledge" are printed in *italics*.

ADHYA, JNANENDRA KUMAR, M.Sc. (Cal.), 30, Judge's Court Road, Alipore, Calcutta. Chemical Laboratory Assistant, Govt. Test House, Alipore, Calcutta. Took the M.Sc. degree of the Calcutta University in 1920. Served as an asst. chemist in the Research Dept. of Messrs. Bird & Co., Calcutta. At present employed as a Chemical Laboratory Assistant, Govt. Test House, Alipore, Calcutta. Late Hon. Secretary, Presidency College Chemical Society, Calcutta. (*Signed by*) N. Brodie, J. Bhaduri, B. B. Dey.

APPLEBEE, HARRY CHARLES, 509, Edge Lane, Droylsden, nr. Manchester. Chief Works Chemist, Manchester Corporation Gas Works, Bradford Road, Manc. Finsbury Technical College (Chemical Department), 1902–1905 (Certificate). Associate of the Institute of Chemistry (1918). Lecturer, Chemistry of Gas Manufacture, Manchester College of Technology. (*Signed by*) E. F. Morris, F. M. Rowe, Frank Lee Pyman, F. S. Sinnatt, E. Williams.

AVEY, GILBERT JAMES, Chemical Department, Northern Polytechnic Institute, Holloway, London, N.7. Lecturer in Chemistry. Wish to receive the Journals of the Society. (*Signed by*) T. J. Drakeley, Raymond R. Butler, Philip Schidrowitz.

BAKER, JOHN WILLIAM, 20, Redfield Lane, Earls Court Rd., S.W.5. Research Student in Organic Chemistry at the Imperial Coll. of Science and Technology. Royal Scholarship in Chemistry, 1916. A.R.C.S. Chem., First Class, 1921. B.Sc. Hons. Chem., First Class, 1921 (London). (*Signed by*) Jocelyn Thorpe, James C. Philip, M. A. Whiteley, C. K. Ingold.

BATTA, BHAGWAN DAS, Nabha State, Panjab (India). Demonstrator in Chemistry, F. C. College, Lahore. Appearing for the Panjab University M.Sc. Degree. B.Sc., Panjab University. Demonstrator in chemistry at Forman Christian College, Lahore. Working on the "Active principle of *Melia Azideracta* (India) leaves." (*Signed by*) N. A. Yajnik, Edwin Theodore Dean, S. R. Khosla.

BEESLEY, DARRELL WEBB, 29, King Edward Rd., Dentons Green, St. Helens. Technical Chemist. Associate of Institute of Chemistry. Asst. works manager, Messrs. Tennants (Lancs.), Ltd., Manchester; previously head chemist for same; prior to this, asst. chemist with United Alkali Co. (*Signed by*) Chas. W. Carpenter, E. L. Rhead, Wm. E. Kay.

BISHOP, WILLIAM ALFRED, 33, Banstead Rd., Purley, Surrey. Chemist. B.A. Cantab. (*Signed by*) H. J. H. Fenton, C. T. Heycock, F. W. Dootson.

BRISLEY, CHARLES WILLIAM, 105, Thurlow Park Road, London, S.E.21. Student at University of Oxford. B.A. Honours (Chemistry). At present doing research for Part II. School of Natural Science (Chemistry). (*Signed by*) F. D. Chattaway, E. Hope, S. G. P. Plant, M. P. Applebey, L. Gowing-Scopes.

BURKE, KATHARINE ALICE, 17, Lion Gate Gardens, Richmond, Surrey. Assistant Lecturer in Chemistry, University College, W.C.1. B.Sc. London. Published papers in the *Journal of the Chemical Society*, and *Zeitschrift für Physikalische Chemie*. Translated "Thermochemistry," by Julius Thomsen, in Sir Wm. Ramsay's series. (*Signed by*) J. N. Collie, Irvine Masson, F. G. Donnan.

BURRAGE, LESLIE JAMES, 32, Emerson Road, Ilford, Essex. Undergraduate at King's College, London. Taking Hons. B.Sc., Chemistry (Oct. 1921). B.Sc. degree obtained Oct. 1921. Being now engaged on research work at King's College I wish to keep in touch with fresh chemical developments. (*Signed by*) Arthur Fairbourne, A. J. Allmand, Harold Toms.

BYLES, JOHN EDWARD, 87, Newlands Park, Sydenham, S.E.26. Chemist, Class II, Government Laboratory. B.Sc. (Manchester), A.I.C. Nine years at Government Laboratory. (*Signed by*) A. G. Francis, F. S. Aumonier, J. R. Nicholls.

CHILD, REGINALD, Yateley Lodge Cottage, Yateley, Camberley. Honours Student of King's College, London. (*Signed by*) Samuel Smiles, H. W. Cremer, C. S. Salmon.

CHRISTIE, GEORGE HALLATT, 155, Sharrow Vale Rd., Sheffield. Engaged in Research in Organic Chemistry with Dr. J. Kenner, Sheffield University. Master of Science (1st Class Hons. Chemistry, Sheffield University). Organic Chemical Research under Dr. Kenner since June 1920. I wish to have access to the Society's Library and receive the Society's Journal. (*Signed by*) W. P. Wynne, J. Kenner, F. G. Tryhorn, A. W. Chapman, Thos. B. Smith.

COFMAN-NICORESTI, GABRIEL, 15, Ludlow Road, Ealing, W.5. Pharmacist Manufacturing Chemist, Member of the Pharmaceutical Society. Director of the Solidol Chemical Co., Mill Street, Dockhead, S.E.1. Inventor and patentee of improvements in or connected with stoves for burning solidified spirit or the like, No. 101569/16, and also improved liniment, No. 18060/15. I desire to make use of the Library and keep in touch with current chemical

literature. (*Signed by*) Jules Cofman-Nicoresti, Hartley Shaw, S. B. Tallantyre.

COURTNEY, WILLIAM BARRY, 12, Caithness Road, Mitcham, Surrey. Student, engaged on research work. I have been a student of the Chemical Department of the South-Western Polytechnic Institute for five years, and have passed the B.Sc. (Honours) examination of the London University in Oct. 1921. (*Signed by*) J. B. Coleman, F. H. Lowe, F. Arnall, J. C. Crocker.

CRUTCHLON, BERNARD WILLIAM ALFRED, 65, Durlston Rd., Upper Clapton, E.5. Honours Student of King's College, London. (*Signed by*) Samuel Smiles, H. W. Cremer, C. S. Salmon.

CURRIE, ARCHIBALD NEIL, M.A., B.Sc. A.I.C., 44, Fisher St., Dennistoun, Glasgow. (The applicant holds the Glasgow University B.Sc. degree with special distinction in his principal subject — Chemistry.) Biochemist to the Glasgow Royal Cancer Hospital. The applicant has two papers ready for publication. The first is "The Fat of Adipose Tissue in Malignant Disease," and will be published shortly either as a Hospital Bulletin or in the *Journal of Exptl. Pathology and Bacteriology*. The second, which is one of a series of "Studies in Fat Pigment," is entitled: "A Preliminary Note on the Separation of Pigment from Accompanying Fat." (*Signed by*) G. G. Henderson, T. S. Patterson, J. Roberts.

DALTON, JAMES OWEN CHESSHYRE, The Plot, Adams Road, Cambridge. Engaged in Research work at Cambridge University. Honours Degree in Nat. Science Tripos Part II., June 1921. (*Signed by*) W. J. Pope, T. M. Lowry, W. H. Mills.

EDWARDS, ARTHUR WILLIAM, 4, Dunvegan Road, Eltham, S.E.9. Chemist. (1) Early education at Dorchester Grammar School; winner of the science prize in 1902. (2) Studied Analytical Chemistry and Physics at Duncan's School of Pharmacy under Mr. William Duncan, F.C.S., Ph.C., also at Darlington Technical College, and under private tutors. (3) Matriculated at Edinburgh University in 1909, for the study of chemistry. (4) Passed the minor examination of the Pharmaceutical Society of Great Britain in 1909; Member of the British Pharmaceutical Conference. (5) Engaged in bacteriological and pharmaceutical chemistry under Mr. J. E. Langford Moore, F.C.S., at St. Bartholomew's Hospital. (6) For five years with the English Company of Farbenfabriken vorm. Friedrich Bayer & Co., Elberfeld and Leverkusen, under Dr. C. R. Henning, Ph.D., F.C.S. (7) Served in the Royal Engineers—gas services—during the War. (8) At present with Messrs. R. W. Greeff & Co., Ltd., of Thames House, Queen Street Place, E.C.4, in an advisory and technical capacity. (9) Keenly desirous of keeping in touch with up-to-date Chemical Research and receiving the publications of the Chemical Society. (*Signed by*) J. E. Langford Moore, Percy Barrs, Frank B. Arnold, William Duncan, Charles Cockle.

ELLINGWORTH, SAMUEL, 74, Millfield Road, York. Research Chemist, Dept. of Organic Chemistry, University of Leeds. B.Sc. (Leeds), 1st Class Honours, 1916. M.Sc. 1918. Chemist to the British Dyestuffs Corporation (Huddersfield), Ltd. (1916–1921). (*Signed by*) J. B. Cohen, P. K. Dutt, Arthur Smithells, Akira Shimomura.

FISHER, KENNETH, Eton College. Schoolmaster. M.A. (Oxon), Ph.D. (Jena). (*Signed by*) W. H. Perkin, D. Ll. Hammick, R. H. Thomas, T. W. J. Taylor, E. Hope, N. V. Sidgwick.

FREDERIKSE, WILLIAM ALEXANDER, Amsterdam, Honthorststraat 2. Chemical Student, University of Amsterdam. Qualifications none. Desires to become a fellow of the Chemical Society, in order to profit by the Journal

and other publications. (*Signed by*) H J. Backer, J. C. Irvine, R. Robinson.

GOEL, MIRI LAL, Royal Artillery Bazar, Ambala, Punjab (India). 2nd Professor of Chemistry, Meerut College, Meerut (U.P.). B.Sc. with Honours in Chemistry; M.Sc. of the Punjab University; Research Scholar of the Punjab University for some time; Demonstrator of the B.Sc. IV year class Govt. College Chem. Lab. while student of the M.Sc. class; Professor of the Divisional College, Meerut (U.P.), since November 1919, taking both Intermediate and B.Sc. classes. Joint author of the paper published in J.C.S. (Trans., 210; 1921 Feb.); worked as Consulting Chemist of the Goel Scientific and Technical Works, Meerut; Organised "Iswar" Soap Factory, R.A. Bazar, Ambala; doing research work on essential oils and dyeing extracts from vegetable dyestuffs in the College at present. (*Signed by*) Horace B. Dunnicliff, N. A. Yajnik, Edwin Theodore Dean, Shanti Swarupa Bhatnagar, Bawa Kartar Singh.

GOSS, FRANK ROBERT, 4, Abbotsford Rd., Goodmayes, Ilford, Essex. Neil Arnott Research Scholar of the University of London. Student from 1918 to 1921 at the Royal College of Science, obtaining on completion of course the Associateship (A.R.C.S.) in Chemistry, and B.Sc. (Lond.) with Honours in Chemistry. I have been awarded the Neil Arnott Medal in Chemistry of the Univ. of London, and am at present working in the Organic Chemistry Research Laboratories of the Royal Coll. of Science. (*Signed by*) Jocelyn Thorpe, M. A. Whiteley, C. K. Ingold.

GREY, EGERTON CHARLES, Medical School, Cairo, Egypt. Professor of Chemistry. D.Sc., M.B. Author of several papers on the Chemical Action of Bacteria, published in the Proc. of the Royal Society. (*Signed by*) Arthur Harden, F. R. Henley, Robert Robison, Ida Smedley Maclean.

GRIMWOOD, ROBERT CHARLES, 11, Billiter Square, E.C.3. Research Student, Royal College of Science. Associate City and Guilds, Finsbury Institute. Registered Student at Institute of Chemistry. (*Signed by*) Jocelyn Thorpe, Robt. G. Grimwood, M. A. Whiteley, C. K. Ingold.

HAMMOND, GEORGE GRIMSHAW, 254, Mill Street, Toxteth, Liverpool. Analyst and Chemist. Bachelor of Science (Manchester). Member of The Pharmaceutical Society. (*Signed by*) Arthur W. Duncan, Frederick Owen, Walter Salmon.

HAMOR, WILLIAM ALLEN, Mellon Institute of Industrial Research, University of Pittsburgh, Pittsburgh, Pa., U.S.A. Assistant Director of the Mellon Institute of Industrial Research. Educated, University of Pittsburgh, 1904–1907; Master of Arts, 1913. Research Chemist, College of the City of New York, 1907–1914. Assistant to the Director, Mellon Institute, Pittsburgh, Pa., 1914–1916. Assistant Director, Mellon Institute, since 1916. Shale Oil Expert, Department of Mines of Canada, 1908. Editorial Staff, *Journal of Industrial and Engineering Chemistry*, 1912–1914. Editorial Board Member, "The Science History of the Universe," 1909. Commissioned a Major in the Chemical Warfare Service, United States Army, November 28, 1917; served in France ten months as assistant chief of the Technical Division, C.W.S., A.E.F.; honourably discharged, December 6, 1918. Member of the National Research Council on the Division of Research Extension, 1921–1924. Member of the National Research Council's Sub-Committee on Airplane Fuels, 1917. Member of various committees of the American Chemical Society, 1913–1921. Specialist in hydrocarbon chemistry. Author of the following books: "A History of Chemistry," 1909; "The American Petroleum Industry" (with R. F. Bacon), 2 vols., 1916; "The Examination

of Petroleum" (with F. W. Padgett), 1920; and "American Fuels" (with R. F. Bacon), 2 vols., 1922. Also author of a series of papers and reports of researches on oil-shales, petroleum, fuels, and anæsthetics. Contributor to scientific journals on educational subjects, especially on the value of industrial research and chemistry. Member of the American Chemical Society, American Electrochemical Society, and Alpha Chi Sigma and Phi Lambda Upsilon fraternities. Residence: 1030, Victoria Avenue, New Kensington, Pa. Business Address, Mellon Institute of Industrial Research, Pittsburgh, Pa., U.S.A. (*Signed by*) Marston Taylor Bogert, Raymond F. Bacon, Chas. Baskerville.

HART, LESLIE RALPH, 'Beaulieu,' St. Albans, Herts. Research Student. London University B.Sc. Examination in Honours Chemistry, 1st Class, November 1921. (*Signed by*) Samuel Smiles, A. J. Allmand, A. Fairbourne, D. T. Gibson.

HUME-ROTHERY, WILLIAM, Mendip House, Headington Hill, Oxford Research Student in Chemistry. I am a Natural Science Demy of Magdalen College, Oxford, and have taken the Oxford B.A. Degree in Chemistry (Part I of the Final Honours Course) and am now engaged in Research Work in Inorganic Chemistry (for Part II of the Final Honours Course). I intend to devote my life to Research Work and wish to join the Society to keep in touch with the developments of the Science. (*Signed by*) Frederick Soddy, B. Lambert, M. P. Applebey, A. F. Walden, W. H. Perkin, E. Hope.

IRVINE, FRANK MOUAT, 30, Clayton Road, Jesmond, Newcastle-on-Tyne. Lecturer in Chemistry at Armstrong College, Newcastle. B.Sc. (1st Class Hons. Chemistry) (Dunelm), A.I.C. Formerly Research Chemist with Messrs. Cookson & Co., Ltd., Lead and Antimony Manufacturers, Willington, Quay-on-Tyne. (*Signed by*) W. N. Haworth, Grace C. Leitch, J. A. Smythe, C. F. Allpress.

JENKINSON, JOHN ALBERT, School House, Little Sutton, nr. Birkenhead. Science Master at the Plympton Grammar School, South Devon. Student at Liverpool University (Final Examination 1921). B.Sc. (Hons. Chem.). Teacher of Science at Plympton Grammar School. (*Signed by*) E. C. C. Baly, W. C. McC. Lewis, I. M. Heilbron.

JOHNSON, ROWLAND NICHOLAS, 'Greenstede,' West Hill, East Grinstead, Sussex. Research Student at King's College, London. Honours B.Sc. (London), November 1921. First Class in Chemistry with Physics. (*Signed by*) A. J. Allmand, Samuel Smiles, A. Fairbourne.

KOHLI, SARAL JANG, M.Sc., Sat Updesh, Lahore (Punjab), India. Professor of Chemistry, Prince of Wales College (Kashmir State College), Jammu (Kashmir), India. (1) A First Class B.Sc. of the Punjab University, standing first in my combination (Physics and Chemistry) of subjects. (2) A First Class M.Sc. in Chemistry, standing first in the Punjab University. (3) Have done some work on the Radioactivity of Indian Minerals. (4) Have great desire to continue my studies and research work. (5) Am working as a Professor of Chemistry, teaching B.Sc. classes. (*Signed by*) N. A. Yajnik, E. T. Dean, S. R. Khosla.

LAKE, DAVID JOHN, 36, Gerald St., Hafod, Swansea. Science Master, Daventry Grammar School. Passed B.Sc. (London), 1920. Student Swansea Technical College, 1916–1920; Student Swansea University, 1920–Jan. 1921; since Jan. 1921, Science Master, Daventry Grammar School, Northants. (*Signed by*) E. A. Tyler, T. H. Hooper, D. G. Hopkins.

LANGWELL, HUBERT, Wentworth, Denham Road, Epsom, Surrey. Research Chemist. Ten years research on the fermentation of celluloses. (*Signed by*) C. F. Cross, Robt. Ensoll, E. J. Charlton, William Bacon.

LEGG, VERNON HOWES, 95, Carter Knowle Road, Sheffield. Student, Sheffield University. Took the three years' day course in Chemistry at Sheffield University and obtained the B.Sc. Honours Degree (Chemistry). Am at present engaged in Research Work at the Applied Science Dept. (*Signed by*) W. P. Wynne, R. V. Wheeler, J. Kenner, Arthur W. Chapman.

MCRAE, JOHN ALEXANDER, Queen's University, Kingston, Ont., Canada. Assistant Professor of Chemistry, Queen's University. M.A. (Queen's Univ., Kingston), Ph.D. (Manchester), F.I.C. 1912–1915, Lecturer on Chemistry, Queen's University, Kingston, Canada. 1915–1919, Asst. Professor of Chemistry, Queen's University, Kingston, Canada. 1919–1921, Research Student at Univ. of Manchester as holder of Special Fellowship from the Honorary Advisory Council for Scientific and Industrial Research of Canada. (*Signed by*) Arthur Lapworth, F. P. Burt, Henry Stephen, F. Fairbrother, Frederick Challenger.

MATTHEWS, MARCUS AURELIUS, 'Burghley,' 47, Spratthall Rd., Wanstead, E.11. Student for M.Sc. Student at East London College for three years. B.Sc., Second Class Honours in Chemistry. (*Signed by*) F. G. Pope, F. W. Turner, J. R. Partington.

MAXTED, DURBAN ROY, 7, New Road, Reading. Lecturer, University College, Reading. A.R.C.Sc. (1918); B.Sc. (London). 1st Class Hons, Chemistry, 1919. Assistant chemist to Bow Bridge Dye Works, London, E., June 1919–Jan. 1920. Lecturer in Organic Chemistry, University College. Reading, since Feb. 1920. (*Signed by*) H. Bassett, Reginald G. Durrant, J. W. Dodgson.

MORGAN, WALTER THOMAS JAMES, 171, Kensington Avenue, Manor Park, London, E.12. Student, East London College (University of London), Entering for B.Sc. (Hons. Chem.) in Oct. 1922. Inter. B.Sc., 1920. Assistant chemist in the Research Laboratory of the South Metropolitan Gas Company from June 1917–Oct. 1918. (*Signed by*) E. V. Evans, J. R. Partington, F. G. Pope.

MORRISON, JOHN SYDNEY, 23, Seymour Rd., Cheadle Hulme, Manchester. Technical Chemist and English Representative of Messrs. Perry & Hope, Ltd., Firth and Clyde Chemical Works, Nitshill, nr. Glasgow. 1908–1913, Manc. School of Technology, awarded diploma for pure and applied chemistry, also courses in gas engineering, gas manufacturing, bleaching and dyeing, dairy analysis. Ministry of Munitions, D.E.S., London, 1916–1919. Superintendent Chemist and Assistant Manager at Folly explosive gas factories, Gretna, Litherland, West Gorton, and Sutton Oak. Awarded O.B.E. July 1920. Messrs. Perry & Hope, Ltd., Glasgow, 1920–1921, Technical Chemist and Representative. (*Signed by*) James Booth, Herbert H. H. Lorenz, John H. Jeffery, John Turnbull.

OWEN, EDWARD JOHN, Porthdafarch Farm, Holyhead, N. Wales. Organic Chemist, employed by Messrs. The British Drug Houses, Ltd., City Road, London, N.1, in the manufacture of complex organic compounds since Oct. 3, 1921. B.Sc. (Wales) with Second Class Honours in Chemistry. (*Signed by*) Kennedy Orton, Owen Owen, L. Hunter, H. B. Watson, Frederick Soper.

PARSONS, ALFRED TENNYSON, 25, Westwell Rd., Streatham, S.W.16. Chemist, Class 2, Government Laboratory. B.Sc. (Dunelm), A.I.C. (*Signed by*) Robert Robertson, Geo. Stubbs, J. Carmichael.

PATTERSON, WILLIAM HAMILTON, University of London Club, 21, Gower St., W.C.1. Lecturer in Chemistry, East London College, University of London, M.Sc., University of Manchester, A.I.C. Assistant Versuchsanstalt, Karlsruhe, Germany. Carnegie Research Scholar, Iron and Steel Institute,

1913. Various Research Publications. (*Signed by*) F. G. Pope, O. L. Brady, W. E. Garner.

PODD, PARTRIDGE LESLIE, 8, St. Peter's St., Ipswich. Post-graduate Research Student at University College, London. Passed B.Sc. Honours Exam. of London University, 1921. As a research student, I desire to have the privilege of using the library of the Society, and I also desire to keep in touch with the advance in knowledge of all branches of chemistry through the medium of the Chemical Society. (*Signed by*) Irvine Masson, Henry Terrey, J. N. E. Day.

RAU, KRISHNARAJPET VENKATA, Ananda College, Colombo, Ceylon. Assistant Master, Ananda College. B.A. (Madras), B.Sc. (London). Ten years' teaching experience. (*Signed by*) J. P. C. Chandrasena, W. N. Rae, M. Parthasarathy.

RAY, FRANK CRAFER, 47, Alfriston Rd., West Side, Clapham Common, S.W.11. Assistant Lecturer, Chemical Department, Battersea Polytechnic, S.W.11. B.A. (Cantab.) (*Signed by*) Harold Hunter, A. Houssa, S. Greenberg, J. L. White, Robert H. Pickard, J. Kenyon.

STEVENSON, FRANCIS MALCOLM, 26, Albert St., Belper, nr. Derby. Dyers' Chemist. Graduated at Leeds University in Colour Chemistry (Hons.), and now desirous of keeping in touch with chemical advances and research. *Signed by*) A. G. Perkin, R. B. Forster, J. B. Cohen.

STEWART, JESSIE, School House, Helmington Row, Crook, Co. Durham. Research Student. B.Sc. Durham University. First Class Honours in Chemistry. (*Signed by*) Samuel Smiles, A. J. Allmand, David T. Gibson.

TATNER, GILBERT HENRY, 52, Melrose Street, Hull. Student, University of Leeds. Studying for Honours B.Sc. (Chemistry). Date of Honours Examination, 1922. (*Signed by*) Arthur Smithells, J. B. Cohen, H. M. Dawson, M. Sybil Leslie, W. Lowson.

TANSLEY, LEONARD BEAUMONT, M.C., M.A., 'Espérance,' Purley, Surrey. Science Coach. Honours Graduate in Chemistry, etc., of Trinity College, Cambridge University. Lecturer and Examination Coach in Science at the General Engineering College, S.W.5. (*Signed by*) Francis Arnall, Frank Matthews, J. C. Crocker.

TAYLOR, GEORGE, Frigorifico, Campana, F.C.C.A., Argentine, S. America. Chief Chemist. Member of British Assn. of Chemists. Late Asst. Chemist to Liverpool Gas Co. (*Signed by*) Harold A. Auden, Frank B. Small, J. C. Frodsham.

THOMSON, ROBERT WILLIAM MURRAY, 117, Highbury Hill, London, N.5. Lecturer. B.Sc. of St. Andrews University. Assistant Lecturer in Physical Chemistry at King's College, University of London. (*Signed by*) Samuel Smiles, H. W. Cremer, John H. Foulger.

WALMSLEY, JAMES RAWSON, Dean Brook Cottage, Dean Lane, Moston, Manchester. Analyst and Pharmaceutical Chemist. Member of the Pharmaceutical Society of Gt. Britain. Associate of the Institute of Chemistry. Associate of the Manc. College of Technology (Genl. Chemical Technology). Lecturer (part-time) College of Technology, Manc. (*Signed by*) Frederick Owen, Samuel E. Hodgkinson, Walter Salmon, William Jackson Lund, Jas. Grant.

WHITE, WALTER ARTHUR, 144, Shelley Avenue, Manor Park, E.12. Assistant Analytical Chemist. Assistant to Dr. G. W. Clough in his analytical practice at the Royal Veterinary College, Camden Town. Formerly assistant to Dr. G. D. Lander. Student at the Sir John Cass Institute for the Final B.Sc. (Honours Chemistry) Examination of the University of London. (*Signed by*) G. W. Clough, W. H. Barker, E. D. Griffiths, W. T. Clough.

WIGHTMAN, WILLIAM PERSEHOUSE DELISLE, 59, Holmewood Gardens, Streatham Hill, London, S.W.2. Student. Student for degree in Chemistry. (*Signed by*) James C. Philip, M. A. Whiteley, H. F. Harwood, H. Ellingham.

WISEMAN, JULIUS, B.Sc., 102, Cambridge Rd., Mile End, E.1. Demonstrator Chemistry Dept., Guy's Hospital, and Student in Medicine. (*Signed by*) C. S. Gibson, A. J. Allmand, Samuel Smiles.

WOOSLEY, DUNCAN PAX, 96, Roxborough Road, Harrow, Middlesex. Chemical Laboratory Assistant. With The British Drug Houses, Ltd., Graham St., City Rd., N.1., since Aug. 1919. Student at Birkbeck College Univ. of London, Sept. 1919 to date, reading for B.Sc. Hons. Chem. I desire to have access to the Library and to keep in touch with modern developments. (*Signed by*) Francis H. Carr, O. A. Le Beau, James Taylor.

WRIGHT, ROBERT NORMAN, 16, Redcliffe St., South Kensington, S.W.10. Assistant Chemist to the Dried Milk Dairy Products Company, Hemyock, Devon. A.R.C.S. (1st Class in Chemistry), B.Sc. (Lond.). (1st class Honours), A.I.C. Dec. 1920, appointed assistant chemist in the Research Laboratory of Messrs. J. Lyons & Co., Ltd. (*Signed by*) H. B. Baker, James C. Philip, A. E. Dunstan, F. B. Thole, Philip C. Bull.

Certificates have been accepted by the Council under Bye-Law I (2) in favour of the following:

BEARPARK, ARTHUR FREDERICK, 'Kingsfold,' Mill Street, Capetown. Postal Address, P.O. Box 1159, Capetown. Postal address in U.K. c/o Henry Tyrer & Co., Ltd., 360, Royal Liver Building, Liverpool. General Manager, Whaling Companies. Three years pupil with H. Thompson, Esq., F.C.S., Hull. Five years chemist to British Oil and Cake Mills, Limited. Member of the Royal Society of South Africa. Member of the South African Chemical Institute. Member of the Chemical, Metallurgical and Mining Society of South Africa. (*Signed by*) Harry Thompson, *Edward B. Maxted.*

SEN, SURESH CHANDRA, Mungpoo P.O., Riyang D. H. Ry., India. Assistant Quinologist, Government of Bengal. B.Sc. (Calcutta), B.A. (Cantab.). Desires to receive the Journal. (*Signed by*) G. E. Shaw.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, February 2nd, 1922, at 8 p.m., Professor H. E. ARMSTRONG, LL.D., F.R.S., Vice-President, in the Chair.

The Chairman referred to the loss sustained by the Society, through death, of the following Fellows:

	Elected.	Died.
Thomas Duxbury	Dec. 15th, 1892.	Nov. 26th, 1921.
James Hill Fairweather	June 18th, 1908.	
Herbert Garland	May 15th, 1913.	April, 1921.
David Emrys Williams	Dec. 6th, 1917.	Jan. 9th, 1922.

The following were formally admitted Fellows of the Chemical Society: H. C. Bell, S. F. Birch, W. A. P. Challenor, P. C. Chaumeton, L. G. F. Dolley, D. T. Gibson, E. J. Hartung, D. N. Jackman, J. H. Middleditch, J. R. Pickering, E. H. Usherwood, I. W. Wark, and L. D. Williams.

Certificates were read for the first time in favour of:

George Macdonald Bennett, M.A., M.Sc., F.I.C., 94, Mercers Road, Tufnell Park, N.19.

Eric Sykes Brooks, Verandah Buildings, Dalton-in-Furness, Lancs.

Fred Brumfitt, 123, Tennyson Place, Bradford.

Carlton Butler, B.Sc., A.I.C., 23, Winifred Road, Urmston, Manchester.

Francis Arthur Freeth, O.B.E., M.Sc., F.I.C., Heather Croft, Hartford.

Thomas Weatherill Harrison, B.Sc., F.I.C., 18, Elfindale Road, S.E.24.

Eusebius Holmes, B.Sc., Eastern Green, Coventry.

Lingaiah Basavalingaiah Manjunath, B.A., University College, Gower Street, W.C.2.

George Flaxman Underhay, B.Sc., Allerton, Woodside Avenue, Muswell Hill, N.10.

William Andrew Shakespeare Vardy, Winksley Vicarage, Ripon.

A Certificate has been authorised by the Council for presentation to ballot under Bye-Law I (2) in favour of:

Suresh Chandra Sen, B.A., B.Sc., Mungpoo P.O., Riyang, D.H.Ry., India.

The following papers were read:

"The action of light on silver bromide." By E. J. HARTUNG.

"The structure of the benzene nucleus. Part I. Intra-nuclear tautomerism." By C. K. INGOLD.

"The structure of the benzene nucleus. Part II. Synthetic formation of the bridged modification of the nucleus." By C. K. INGOLD.

"The structure of the benzene nucleus. Part III. The suppression of intra-nuclear change." By C. K. INGOLD and H. A. PIGGOTT.

"Platinum catalyst for automatic gas lighters." By L. D. WILLIAMS.

Ordinary Scientific Meeting, held in the Lecture Hall of the Institution of Mechanical Engineers, on Thursday, February 9th, 1922, at 8 p.m., SIR JAMES WALKER, D.Sc., LL.D., F.R.S., President, in the Chair.

SIR ERNEST RUTHERFORD, D.Sc., F.R.S., delivered his Lecture entitled "Artificial Disintegration of Elements." A vote of thanks to the Lecturer, proposed by Professor H. E. Armstrong, seconded by Professor F. G. Donnan, and supported by the Chairman, was carried with acclamation, and acknowledged by Sir Ernest Rutherford.

Ordinary Scientific Meeting, Thursday, February 16th, 1922, at 8 p.m., SIR JAMES WALKER, D.Sc., LL.D., F.R.S., President, in the Chair.

The PRESIDENT announced that the Society had lost, through death, the following Fellows:

	Elected.	Died.
Charles Baskerville.....	April 21st, 1898	Jan. 28th, 1922
George Gilbert Pond	April 22nd, 1903	May 20th, 1920

The following were formally admitted Fellows of the Chemical Society: A. N. Campbell, W. Davies, A. A. Davis, F. Dickens, A. S. Russell, P. M. Tookey, and M. Williams.

Certificates were read for the first time in favour of:

Frederick Mason Brewer, Lincoln College, Oxford.
Alfred Duncan Gay, 49, Thornlaw Road, West Norwood, S.E.27.
Douglas Cecil Henry, M.A., Hulme Hall, Victoria Park, Manchester.

William Hurst, 2, Edditch Grove, Tonge, Bolton.
Thomas Iredale, B.Sc., 94, Tyrwhitt Road, Brockley, S.E.4.
George Lewis Kennaby, B.Sc., Anglo-Persian Oil Co., Abadan, Persian Gulf.
George Allan Russell, B.Sc., A.I.C., Barnsheen, Ditton, Widnes.
Ernest Arthur Seeley, B.Sc., 10, Hamilton Road, N.5.
Brian Duncan Shaw, Ferns' Hollow, Station Road, Ilkeston.
Arthur Frederick Watson, M.Sc., A.I.C., Brockwell Hall, Herne Hill, S.E.23.
Llywelyn Williams, B.Sc., Herne Bay College, Kent.

The following Certificate has been authorised by the Council for presentation to ballot under Bye-Law I (2) in favour of:

Walter Albert Lawrance, M.A., Ph.D., Bates College, Lewiston, Maine, U.S.A.

Messrs. R. Whytlaw Gray and F. G. Pope were elected Scrutators, and a ballot for the election of Fellows was held. The following were subsequently declared elected as Fellows:

Jnanendra Kumar Adhya, M.Sc.
Harry Charles Applebee, A.I.C.
Gilbert James Avey.
John William Baker, B.Sc.
Bhagwan Das Batta, B.Sc.
Arthur Frederick Bearpark.
Darrell Webb Beesley, A.I.C.
William Alfred Bishop, B.A.
Charles William Brisley, B.A.
Katharine Alice Burke, B.Sc.
Leslie James Burrage, B.Sc.
John Edward Byles, B.Sc., A.I.C.
Reginald Child.
George Hallatt Christie, M.Sc.
Gabriel Cofman-Nicoresti.
William Barry Courtney, B.Sc.
Bernard William Alfred Crutchlow.
Archibald Neil Currie, M.A., B.Sc., A.I.C.
James Owen Chesshyre Dalton, B.A.
Arthur William Edwards.
Samuel Ellingworth, M.Sc.
Kenneth Fisher, M.A., Ph.D.
William Alexander Frederikse.
Miri Lal Goel, M.Sc.
Frank Robert Goss, B.Sc.
Egerton Charles Grey, D.Sc., M.B.
Robert Charles Grimwood.
George Grimshaw Hammond, B.Sc.
William Allen Hamor, M.A.
Leslie Ralph Hart, B.Sc.
William Hume-Rothery, B.A.
Frank Mouat Irvine, B.Sc., A.I.C.
John Albert Jenkinson, B.Sc.
Rowland Nicholas Johnson, B.Sc.
Saral Jang Kohli, M.Sc.
David John Lake, B.Sc.
Hubert Langwell.
Vernon Howes Legg, B.Sc.
John Alexander McRae, M.A., Ph.D., F.I.C.
Marcus Aurelius Matthews, B.Sc.
Durban Roy Maxted, B.Sc.
Walter Thomas James Morgan.
John Sydney Morrison.
Edward John Owen, B.Sc.
Alfred Tennyson Parsons, B.Sc., A.I.C.
William Hamilton Patterson, M.Sc., A.I.C.
Partridge Leslie Podd, B.Sc.
Krishnarajpet Venkata Rau, B.A., B.Sc.
Frank Crafer Ray, B.A.
Suresh Chandra Sen, B.A., B.Sc.
Francis Malcolm Stevenson, B.Sc.
Jessie Stewart, B.Sc.
Gilbert Henry Tatner.
Leonard Beaumont Tansley, M.A.
George Taylor.
Robert William Murray Thomson, B.Sc.
James Rawson Walmsley, A.I.C.
Walter Arthur White.
William Persehouse Delisle Wightman.
Julius Wiseman, B.Sc.
Duncan Pax Woosley.
Robert Norman Wright, B.Sc., A.I.C.

The following papers were read:

"A theoretical derivation of the principle of induced alternate polarities." By A. LAPWORTH.

"An explanation of the property of induced polarity of atoms and an interpretation of the theory of partial valencies on an electronic basis." By W. O. KERMACK and R. ROBINSON.

"Some reactions of benzanthrone." By A. G. PERKIN and G. D. SPENCER.

"A rapid iodimetric estimation of copper and iron in mixtures of their salts." By I. W. WARK.

ANNUAL GENERAL MEETING.

The Annual General Meeting will take place on Thursday, March 30th, at 4.30 p.m. An Informal Meeting will be held the same evening at 8 p.m.

REPORTS ON THE PROGRESS OF APPLIED CHEMISTRY.

(Issued by the Society of Chemical Industry.)

The Society of Chemical Industry has generously offered to supply Volume VI of these Reports to Fellows of the Chemical Society, who are not Members of the Society of Chemical Industry, at the reduced price of 10/-, post free.

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ADDITIONS TO THE LIBRARY.

I. *Donations.*

KINGZETT, CHARLES THOMAS. The popular chemical dictionary. 2nd edition. London 1921. pp. viii + 540. (*Reference.*) 21*s.* net. From the Author.

RUSSELL, T. H. The planning and fitting-up of chemical and physical laboratories. London 1903. pp. xx + 178. ill. (Second Copy.) (*Recd.* 10/1/22.) From the Author.

II. *By Purchase.*

CHAMOT, ÉMILE MONNIN. Elementary chemical microscopy. 2nd edition. New York 1921. pp. xvi + 480. ill. 25*s.* net. (*Recd.* 21/1/22.)

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PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, March 2nd, 1922, at 8 p.m., Dr. M. O. FORSTER, F.R.S., Treasurer, in the Chair.

It was announced that the Society had lost, through death, the following Fellows:

	Elected.	Died.
James Robert Appleyard.....	May 15th, 1890.	Oct. 1921.
Thomas Lynton Briggs	April 19th, 1883.	April 3rd, 1921.
Edward William Taylor Jones	April 6th, 1871.	Feb. 19th, 1922.

The following were formally admitted Fellows of the Chemical Society: F. B. Arnold, J. W. Baker, A. W. Edwards, F. R. Goss, H. Hunter, W. H. Patterson, F. C. Ray, and S. P. Schotz.

The following List of Nominations for vacant places on the Council, the names of those nominated by the Council being indicated by an asterisk, was read from the Chair:

Vice-Presidents who have filled the office of President (*two vacancies*).—*H. B. Dixon; *P. F. Frankland.

Vice-Presidents who have not filled the office of President (*two vacancies*).—*E. C. C. Baly; *T. M. Lowry.

Secretary (*one vacancy*).—*Irvine Masson.

Ordinary Members of Council: (*a*) Town Members, that is, those resident within 50 miles of Charing Cross (three vacancies).—C. Dorée; J. J. Fox; J. R. Partington. (*b*) Country Members, that is, those resident beyond 50 miles from Charing Cross (three vacancies).—*I. M. Heilbron; J. W. McBain; *W. H. Mills.

Certificates were read for the first time in favour of:

Brojo Kishore Banerjee, B.Sc., Jamshedpur Technical Institute, Tatanagar, India.

Benoy Bhusan Basu, B.Sc., M.B., 1/1, Nepal Bhattacherji's Street, Kalighat P.O., Calcutta.

Leslie Ashburn Dunn, 9, Pembroke Terrace, Bridlington.
Richard Fisher, Hudshaw House, Hexham, Northumberland.
Herbert Hodgson, 35, Ryan Street, Bradford.
Arthur Cyril Percy Lunn, King's College, Cambridge.
Robert Craig McDowall, 6, Ascog Street, Crosshill, Glasgow.
Akella Suryanarayana Rao, B.Sc., Vizagapatam, India.
Harry Lister Riley, 7, Trafalgar Square, Chelsea, S.W.3.
James Robinson, B.Sc., Milton High School, Bulawayo, S. Rhodesia.
Suhramania Sastry, B.A., 5, Krishnappa Naik Agraharam, Georgetown, Madras.

The following papers were read:

"New halogen derivatives of camphor. Part II. α′-Bromocamphor." By T. M. LOWRY, V. STEELE, and H. BURGESS.

"The rotatory dispersive power of organic compounds. Part X. The preparation and properties of pure ethyl tartrate." By T. M. LOWRY and J. O. CUTTER.

"The molecular configuration of polynuclear aromatic compounds. Part I. The resolution of γ-6:6′-dinitro- and 4:6:4′:6′-tetranitrodiphenic acids into optically active components." By G. H. CHRISTIE and J. KENNER.

Ordinary Scientific Meeting, Thursday, March 16th, 1922, at 8 p.m., SIR JAMES WALKER, D.Sc., F.R.S., President, in the Chair.

A. T. Parsons was formally admitted a Fellow of the Chemical Society.

Certificates were read for the first time in favour of:

John William Blagden, M.A., Ph.D., F.I.C., Apple Tree House, Grove Road, Woodford, E.18.
Charlie Lyons Carter, M.Sc., 9, Carr Street, N.E. Valley, Dunedin, N.Z.
Arthur Rockett Chadwick, Corporation Sewage Works, Marley, Keighley.
Douglas Creese Harrison, B.Sc., 18, Church Crescent, Muswell Hill, N. 10.
Henry Unwin Harrow, 13, Southwark Bridge Road, S.E. 1.
Ethel Mary James, B.Sc., 1, Rusham Road, Balham, S.W. 12.
Edward Ingleson Lawson, 65, Warrington Road, Newcastle-on-Tyne.
John Mylne Mullaly, 14, Bardwell Road, Oxford.
Harold Edward Charles Powers, B.Sc., 4, Grove Crescent, Woodford, E. 18.
Albert W. Smith, B.S., Ph.D., Case School of Applied Science, Cleveland, Ohio, U.S.A.
Clarence Stott, B.Sc., A.I.C., Benroyd, Holywell Green, Halifax.
William Thomas, B.A., M.Sc., A.I.C., Penfro, Stoneywood, Aberdeen.
John George Walters, B.Sc., 46, Durham Road, East Finchley, N. 2.
William Wallace Watt, 29, Woodstock Road, Golders Green, N.W. 4.
Harry Alexander Wood, Santa Elena, Entre Rios, Argentine.

The following Certificate has been authorised by the Council for presentation to ballot under Bye-Law I (2):

Harilal Basu, P.O. Box 84, Rangoon, Burma.

The following papers were read :

" Change of properties of substances on drying." By H. B. BAKER.
" The influence of nitro-groups on the reactivity of substituents in the benzene nucleus. Part VI. The elimination of halogen during the reduction of halogenated nitro-compounds." By H. BURTON and J. KENNER.

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ADDITIONS TO THE LIBRARY.

I. *Donations.*

DUDLEY, DUD, and others. Mettallum Martis : or iron made with pit-coale, sea-coale, etc., 1665. A treatise of metallica. By JOHN ROVENZON, 1613. Metallica, or the treatise of metallica. By SIMON STURTEVANT, 1612. [Edited by JOHN N. BAGNALL. Wolverhampton 1854.] pp. xix + 43, ii + 30, ii + 120. ill. (*Reference.*) From Professor P. Phillips Bedson.

FISCHER, EMIL. Aus meinem Leben. Berlin 1922. pp. vi + 202. ill. (*Recd.* 18/2/22.) From the Publisher : Julius Springer.

HADFIELD, SIR ROBERT ABBOTT. The work and position of the metallurgical chemist, also references to Sheffield and its place in metallurgy. An address. [London 1921.] pp. 97. ill. (*Recd.* 2/3/22.) From the Author.

HILDITCH, THOMAS PERCY. A concise history of chemistry. 2nd edition. London [1922]. pp. xii + 276. 6*s.* net. (*Recd.* 24/2/22.) From the Publishers : Messrs. Methuen & Co.

JOHNSTONE, SYDNEY JAMES. Potash. (Imperial Institute Monograph on Mineral Resources.) New edition. London 1922. pp. x + 122. 6*s.* net. (*Recd.* 2/3/22.) From the Director.

KANTHACK, R. (Compiler.) Tables of refractive indices. Vol. II. Oils, fats, and waxes. Edited by JOHN NAISH GOLDSMITH. London 1921. pp. 296. 25*s*. net. (*Recd.* 3/3/22.)

From the Publishers: Messrs. Adam Hilger Ltd.

MINISTRY OF MUNITIONS and DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH. Technical records of explosives supply 1915–1918. No. V. Manufacture of sulphuric acid by contact process. London 1921. pp. vi + 128. ill. 25*s*. net. (*Recd.* 3/3/22.)

—— —— No. VI. Synthetic phenol and picric acid. London 1921. pp. vi + 98. ill. 15*s*. net. (*Recd.* 14/2/22.)

From the Department.

PAULI, WOLFGANG. Colloid chemistry of the proteins. Part I. Translated by PERCY CYRIL LESLEY THORNE. London 1922. pp. xii + 140. ill. 8*s*. 6*d*. net. (*Recd.* 28/2/22.)

From the Publishers: Messrs. J. & A. Churchill.

II. *By Purchase.*

ARCHIVIO DI FARMACOLOGIA SPERIMENTALE E SCIENZE AFFINI. Year XVIII, Vol. XXVII, etc. Siena 1919 +. (*Reference.*)

BAUER, K. H. Analytische Chemie der Alkaloide. Berlin 1921. pp. vi + 425. ill. (*Recd.* 18/2/22.)

BEILBY, SIR GEORGE. Aggregation and flow of solids: being the records of an experimental study of the micro-structure and physical properties of solids in various states of aggregation. 1900–1921. London 1921. pp. xvi + 256. + xxxiv plates. 20*s*. net. (*Recd.* 21/2/22.)

CHEMIKER-KALENDER 1922. Edited by WALTHER ROTH. Year 34. 2 vols. Berlin 1922. (*Reference.*)

DEERR, NOËL. Cane sugar: a textbook on the agriculture of the sugar cane, the manufacture of cane sugar, and the analysis of sugar-house products. 2nd edition. London 1921. pp. viii + 644. ill. 42*s*. net. (*Recd.* 17/1/22.)

FOERSTER, FRITZ. Elektrochemie wässeriger Lösungen. 3rd edition. Leipzig 1922. pp. xx + 900. ill. (*Recd.* 18/2/22.)

FORTSCHRITTE IN DER ANORGANISCH-CHEMISCHEN INDUSTRIE: an Hand der Deutschen Reichs-Patente dargestellt. Edited by ADOLF BRÄUER and JOHANNES D'ANS. Vol. I, 1877–1917, etc. Berlin 1921 +. ill. (*Reference.*)

GATTEFOSSÉ, R. M., and GATTEFOSSÉ, J. Nouveaux parfums synthétiques. Lyon 1921. pp. 208. ill. 5*s*. 6*d*. net. (*Recd.* 6/2/22.)

GOW, COLIN CLARENCE. The electro-metallurgy of steel. London 1921. pp. xvi + 351. ill. 27*s*. 6*d*. net. (*Recd.* 17/1/22.)

GRASSER, GEORG. Synthetic tannins: their synthesis, industrial production, and application. Translated by FINI G. A. ENNA. London 1922. pp. viii + 143. 12*s.* net. (*Recd.* 17/1/22.)

HIGGINS, SYDNEY HERBERT. Bleaching: being a résumé of the important researches on the industry published during the years 1908—1920. Manchester 1921. pp. viii + 138. 10*s.* 6*d.* net. (*Recd.* 21/1/22.)

HIRSCH, PAUL. Die Einwirkung von Mikroorganismen auf die Eiweisskörper. (Biochemie in Einzeldarstellungen. IV.) Berlin 1918. pp. x + 256. ill. (*Recd.* 3/3/22.)

HÖFER, JOHANNES. Die Fabrikation künstlicher plastischer Massen sowie der künstlichen Steine, Kunststeine, Stein- und Zementgüsse. 4th edition. Wien 1921. pp. xii + 366. ill. (*Recd.* 25/1/22.)

ILLINGWORTH, STEWART ROY, assisted by JENKYN GRIFFITHS. The analysis of coal and its by-products. London [1921]. pp. [xii] + 380. ill. 21*s.* net. (*Recd.* 17/1/22.)

KANITZ, ARISTIDES. Temperatur und Lebensvorgänge. (Biochemie in Einzeldarstellungen. I.) Berlin 1915. pp. x + 175. ill. (*Recd.* 3/3/22.)

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RÖHMANN, FRANZ. Über künstliche Ernährung und Vitamine. (Biochemie in Einzeldarstellungen. II.) Berlin 1916. pp. vi + 150. ill. (*Recd.* 3/3/22.)

SIEGFRIED, MAX. Über partielle Eiweisshydrolyse. (Biochemie in Einzeldarstellungen. III.) Berlin 1916. pp. iv + 64. (*Recd.* 3/3/22.)

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STEPHENSON, CHARLES H. Some micro-chemical tests for alkaloids. Including "Chemical tests of the alkaloids used." By CHARLES EDWIN PARKER. London 1921. pp. iv + 110 + xxvii plates. 21*s*. net. (*Recd.* 17/1/22.)

TAYLOR, HUGH STOTT. Industrial hydrogen. New York 1921. pp. 210. ill. 20*s*. net. (*Recd.* 21/1/22.)

THOMSON, SIR JOSEPH JOHN. Rays of positive electricity and their application to chemical analyses. 2nd edition. London 1921. pp. x + 238. ill. 16*s*. net. (*Recd.* 21/1/22.)

TREADWELL, FREDERICK PEARSON. Analytical chemistry. Vol. I. Qualitative analysis. 5th English edition. Translated by WILLIAM T. HALL. New York 1921. pp. xviii + 598. ill. 23*s*. net. (*Recd.* 12/1/22.)

III. *Pamphlets.*

ARRHENIUS, SVANTE. Aus meiner Jugendzeit. Leipzig 1913. pp. 18.

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SINGH, BAWA KARTAR. Recent advances in stereochemistry. (From the *J. Proc. Asiatic Soc. Bengal*, 1921, N.S. 17.)

CERTIFICATES OF CANDIDATES FOR ELECTION AT THE BALLOT TO BE HELD AT THE ORDINARY SCIENTIFIC MEETING ON THURSDAY, MAY 4TH, 1922.

N.B.—The names of those who sign from "General Knowledge" are printed in *italics.*

BANERJEE, BROJO KISHORE, Jamshedpur Technical Institute, G. Town, Jamshedpur, Tatanagar, India. Assistant, Chemical and Analytical Department, Jamshedpur Technical Institute, Tatanagar, India. B.Sc. (Calcutta University). Read up to M.Sc. Chemistry with Inorganic Chemistry as special subject in the post-graduate classes of the Calcutta University. Had been assistant in the Chemical and Metallurgical Dept. of the Bengal Engineering College, Sibpur, India, for two and a half years nearly. Now assistant in the Chemical and Analytical Dept. of the Jamshedpur Technical Institute since August 1921. Lecturing on General Inorganic Chemistry since March 1919. (*Signed by*) R. N. Sen, P. C. Chattopadhyay, J. Bhaduri.

BASU, BENOY BHUSAN, 1/1, Nepal Bhattacherji's Street, Kalighat P.O., Calcutta, India. B.Sc., M.B. Assistant Chemical Analyst to the Calcutta Corporation, intending to keep in touch with the modern advancement in Chemistry and the chemical world. (*Signed by*) B. N. Ghosh, T. K. Ghose, K. B. Sen.

BENNETT, GEORGE MACDONALD, 94, Mercers Road, Tufnell Park, N.19. Demonstrator, Chemical Department, Guy's Hospital Medical School. B.A., M.Sc. (London), M.A. (Cantab.), F.I.C. Fellow of St. John's College, Cambridge. Author of several papers in the Transactions since 1913. (*Signed by*) C. S. Gibson, D. C. Vining, Eustace E. Turner, H. C. Bell.

BLAGDEN, JOHN WILLIAM, Apple Tree House, Grove Road, Woodford, E.18. Head of Research Dept., Messrs. Howards & Sons, Ilford. M.A. (Cantab.), Ph.D. (Würzburg), F.I.C. 1899–1900 Demonstrator at the Electrochemical Institute of the Polytechnic, Darmstadt. 1900–1914 Research Chemist with Messrs. Boehringer & Sons, Mannheim. (1914–1919 Civilian Prisoner of War at Ruhleben.) 1919–1922 with Messrs. Howards & Sons as above stated. (*Signed by*) H. B. Baker, J. T. Hewitt, M. O. Forster.

BREWER, FREDERICK MASON, 42, Aberdeen Park, London, N.5. Student. Science Scholar of Lincoln College, Oxford. (*Signed by*) W. H. Perkin, T. W. J. Taylor, D. Ll. Hammick, E. Hope, S. G. P. Plant, N. V. Sidgwick.

BROOKS, ERIC SYKES, M.P.S., Verandah Buildings, Dalton-in-Furness,

Lancs. Chemist. Member of Pharmaceutical Society of Great Britain. Student of Chemistry for the past eight years, also as private coach for elementary chemistry. (*Signed by*) Alex. W. McLaren, Chas. Morton, Alfred Thomas.

Brumfitt, Fred, 123, Tennyson Place, Bradford. Director and Manager, Wholesale Druggists. Diploma Chemistry and Dyeing, Bradford Technical College. Wholesale Druggist. (*Signed by*) V. Steele, F. W. Richardson, Barker North.

Butler, Carlton, B.Sc., A.I.C., 23, Winifred Road, Urmston, nr. Manchester. Research Student in the Victoria University of Manchester. Lanc. C.C. Scholar 1917. Served Sp. Brig. R.E. until Jan. 1919. First Class Honours Chemistry 1921. Research, and part-time demonstrator, session 1921–22. (*Signed by*) H. B. Dixon, Colin Campbell, Frederick Challenger, Henry Stephen.

Carter, Charlie Lyons, 9, Carr Street, N.E. Valley, Dunedin. Lecturer on Chemistry, Otago University, Dunedin, New Zealand. M.Sc. with 1st Class Honours in Chemistry, N.Z., 1919. A.I.C. (London), 1921. Demonstrator in chemistry, Otago University, 1917–19. Lecturer on Chemistry, 1919. Publication : "Mutton-bird Oil," *Jour. Soc. Chem. Ind.*, Sept. 1920, p. 220. (*Signed by*) J. K. H. Inglis, J. Williams, C. S. Hicks.

Chadwick, Arthur Rockett, Corporation Sewage Works, Marley, Keighley. Chemist and Manager, Keighley Corporation Sewage Works. Eighteen and a half years' experience in the Chemistry of Sewage Disposals. Chemist and Manager, Keighley Corporation Sewage Works for two years. Chemist and Manager, Bingley U.D.C. Sewage Works for five years. Chemist and Manager, Prestwich U.D.C. Sewage Works for one and a half years. Chemist and under-Manager at the Thornhill Sewage Works of the County Borough of Dewsbury for ten years. Eight years student at the Dewsbury Technical School in Chemistry and Allied Subjects, and hold Board of Education certificates for all stages. I desire to join your Society so that I can keep in touch with modern methods of water, sewage and trades-waste purification, to obtain your publications and to have the use of your library. (*Signed by*) James H. Kershaw, Herbert J. Taylor, John Senior.

Dunn, Leslie Ashburn, 9, Pembroke Terrace, Bridlington. Assistant Works Chemist, employed by Messrs. Raines & Porter, Ltd., Hull. Was educated at Bridlington School (by scholarship). Studied Chemistry (inorganic, organic, and industrial) at Hull Technical College. Served with 1st E. Yorks. Regt. during the war. Finally assistant to T. A. Nightscales, Esq., F.C.S. (*Signed by*) Thos. A. Nightscales, Harry Thompson, W. Geary.

Fisher, Richard, Hudshaw House, Hexham, Northumberland. Student. During war I was employed in the Hydrophone Department of the Navy (Special Technical Branch). After the war I took up Medical Studies and have always wished for up-to-date chemical information. (*Signed by*) F. C. Garrett, C. R. Gent, John Gibson.

Freeth, Francis Arthur, Heather Croft, Hartford. Chief Chemist, Messrs. Brunner, Mond & Co., Ltd. M.Sc. (Liv.), F.I.C., F.Inst.P., O.B.E. (*Signed by*) F. G. Donnan, W. E. Garner, Henry Terrey, Irvine Masson.

Gay, Alfred Duncan, 49, Thornlaw Road, West Norwood, S.E.27. Analytical Chemist. Three years Junior Assistant to Dr. Bernard Dyer. Fifteen months Assistant Chemist to The Magadi Soda Co., Ltd., B.E.A. Recently engaged as Analytical Chemist to Schweppes, Ltd., Mineral Water Manufacturers. (*Signed by*) R. Lessing, Bernard Dyer, Wm. H. Woodcock, George Taylor.

HARRISON, DOUGLAS CREESE, 18, Church Crescent, Muswell Hill, London, N.10. Research Student in Organic Chemistry under Prof. Smiles at King's College, London. Passed Exam. for B.Sc. (London) with 1st Class Honours, with Chemistry as principal subject and Physics subsidiary. (*Signed by*) Samuel Smiles, A. J. Allmand, A. Fairbourne.

HARRISON, THOMAS WEATHERILL, 18, Elfindale Road, S.E.24. Chemist, Government Laboratory, London. B.Sc. (London). F.I.C. "Titration with Permanganate in Presence of Hydrochloric Acid." "The Action of Dimethyl Sulphate upon Oils of the Aromatic and Aliphatic Series." (*Signed by*) E. Grant Hooper, Geo. Stubbs, J. J. Fox.

HARROW, HENRY UNWIN, 13, Southwark Bridge Road, S.E.1. Senior Assistant Chemist, Barclay, Perkins' Brewery. Inter. B.Sc. (London), 1906. Chemist, South African Breweries, Johannesburg, from 1913 to 1920. Sitting for B.Sc. Hons. (London) in 1923 (October). (*Signed by*) J. Kenyon, J. L. White, S. Greenberg.

HENRY, DOUGLAS CECIL, M.A., Hulme Hall, Victoria Park, Manchester. Lecturer in Chemistry at the University of Manchester; Fellow of Trinity College, Cambridge; late Coutts-Trotter Scholar. Two years' research work, not at present published, on Adsorption from Solution, the results embodied in a thesis; won a Fellowship of Trinity College, Cambridge (Oct. 1921). Teaching experience—two years' coaching and tutorial work for Trinity, Cambridge. Lecturing and demonstrating at Manchester. (*Signed by*) Harold B. Dixon, Arthur Lapworth, F. P. Burt, J. E. Myers, Henry Stephen, Angus F. Core, Colin Campbell.

HODGSON, HERBERT, 35, Ryan Street, Bradford, Yorks. Analytical Chemist. Over twenty years assistant to Mr. F. W. Richardson, City Analyst of Bradford, and County Analyst of W.R. of Yorks. Also with the firm of Messrs. Richardson & Jaffé, Industrial Chemists. Experience in most branches of Analytical Chemistry. Also with R.E. "Anti-Gas," University College, London. (*Signed by*) F. W. Richardson, A. Jaffé, Geoffrey A. Bracewell.

HOLMES, EUSEBIUS, Eastern Green, Coventry. Student of Chemistry. Qualified for B.Sc. (Birm.). Desiring access to recent chemical literature. (*Signed by*) C. E. Wood, Wm. Wardlaw, E. Ashley Cooper.

HURST, WILLIAM, 2, Edditch Grove, Tonge, Bolton. Analytical and Manufacturing Chemist, c/o Thos. Moscrop & Co., Bolton, Oil Blenders and Refiners, Lubricants, etc. 1st Class Certificates, Lancs. and Cheshire Inst.: Mathematics 3rd year, and Chemistry, Inorganic and Organic, 4th year. Final Certificate of The City and Guilds Inst., London, in Oils, Fats, and Waxes. Two and a half years' Senior Chemistry Course (full time), Mining and Technical College, Wigan, 1919–1921. At present attending the College of Technology, Manchester. (*Signed by*) John Allan, Frank Lee Pyman, E. B. Naylor, T. H. Winstanley.

IREDALE, THOMAS, 94, Tyrwhitt Road, St. Johns, S.E.4. Scholar of the 1851 Exhibition. B.Sc. (Sydney, Australia), 1919. Have since been engaged in research. Papers published in Transactions of Chem. Soc. (1921). *Signed by*) F. G. Donnan, I. W. Wark, E. J. Hartung, D. C. Jones.

JAMES, ETHEL MARY, 1, Rusham Road, Balham, S.W.12. Assistant Science Mistress, Clapham County Secondary School, S.W.11. B.Sc. (Lond.); Hons. Chem. 1920, after studying at Bedford College from 1916–20. At present teacher of chemistry at the above school. (*Signed by*) Holland Crompton, J. F. Spencer, M. S. Crewdson.

KENNABY, GEORGE LEWIS, Abadan, Persian Gulf. Chemist. B.Sc.

(London), 3rd Class Honours in Chemistry, 1920, since which I have been working for the Anglo-Persian Oil Co. at their refinery in Persia. I am desirous of keeping in touch with the recent developments in chemistry with the object of taking my A.I.C. at some future date. (*Signed by*) F. G. Donnan, W. E. Garner, Irvine Masson, Henry Terrey.

Lawson, Edward Ingleson, 65, Warrington Road, Newcastle-on-Tyne. Teacher of Chemistry at Dame Allan's School, Newcastle-on-Tyne. Student of Chemistry for four years at Leeds University. Teacher of Chemistry for four years at Newcastle. (*Signed by*) J. R. Scott, R. M. Woodman, John Stanley Carter, Edgar Rhodes.

Lunn, Arthur Cyric Percy, King's College, Cambridge. Student. Part I Nat. Science Tripos, 1921. Taking Part II (Chemistry, May 1922). (*Signed by*) Hamilton McCombie, Harold A. Scarborough, A. E. Cashmore, C. T. Heycock, W. H. Mills, Douglas F. Harrison.

McDowall, Robert Craig, 6, Ascog Street, Crosshill, Glasgow. Analytical Chemist to Messrs. Perry & Hope, Ltd., Forth & Clyde Chemical Works, Nitshill. Cream of Tartar Subs., Malt Extract, Food Products generally 1904–1911 (7 years). Technical and Chemical Adviser to Messrs. Craig, McDowall & Co., Thornliebank, Glasgow, Cream of Tartar Subs., Baking Powders, and other Food Products, Mag. Sulph., Ferro Sulph., Soda Sulph., etc., 1911–1915 (4½ years). Glasgow Highlanders, H.M. Forces, 1915–1918 (3½ years). Technical Chemist and Representative, also Process Superintendent to Messrs. Perry & Hope, Ltd., Forth & Clyde Chemical Works, Nitshill, 1918–1922 (4 years). Having been connected for the past sixteen years with the manufacture and analysis of foodstuffs I am desirous of keeping in touch with all latest books and papers appertaining to same. (*Signed by*) James Booth, J. Turnbull, Herbert Lorenz, W. McHutchison.

Manjunath, Lingaiah Basavalingaiah, London. Student of the London University. B.A. degree in Chemistry of the Madras University. At present a student for the London M.Sc. degree in Chemistry in the University College. (*Signed by*) O. L. Brady, E. H. Thierry, J. N. E. Day.

Mullaly, John Mylne, 14, Bardwell Road, Oxford. Student of Chemistry. Part author of paper *Trans. Chem. Soc.* CXIX, p. 1802 (1921). Commoner of Balliol College. (*Signed by*) H. Hartley, C. N. Hinshelwood, E. J. Bowen, H. R. Raikes.

Powers, Harold Edward Charles, 4, Grove Crescent, Woodford, E.18. Analytical Chemist. B.Sc. Hons. (2nd Class). About six years' practical experience in technical laboratory. (*Signed by*) Hugh Main, George Senter, F. Barrow, S. Sugden, Alfred J. White.

Rao, Akella Suryanarayana (Junior), Vizagapatam, India. B.Sc. in Chemistry, Botany (National University, Adyar, Madras). I intend joining the Society fully believing that by doing so I shall be in the know of the recent work in chemistry, which would be of immense use to me as a prospective research chemist. (*Signed by*) T. S. Natrajan, S. N. Dhar, K. C. Viraraghavan.

Riley, Harry Lister, 7, Trafalgar Square, Chelsea, S.W.3. Student (Research) at the Royal College of Science. A.R.C.Sc. and B.Sc. (Hons.) London. (*Signed by*) H. B. Baker, James C. Philip, J. N. Sugden, H. J. T. Ellingham, A. A. Eldridge.

Robinson, James, Bulawayo, S. Rhodesia. Science Master, Milton High School, Bulawayo. B.Sc., Univ. of Wales. Completed 1st year London Final Sc. Course in Mechanical Engineering (Matriculated 1st Div. Inter. Sc., London). Completed advanced practical courses on Fibres, Detergents,

Alkaloids, Assays. One session's research work on "The Action of SO_2, Sulphites, Meta-bisulphate on various Peroxides (BaO_2, H_2O_2, CeO_2, PbO_2) in Comparison with MnO_2 and with the action on $K_2Mn_2O_8$,CrO_3, and Persulphates as Oxidising Agents," under Prof. Herbert Jackson, King's College, London. (*Signed by*) Geo. A. Pingstone, Arthur Slator, A. L. Stern.

RUSSELL, GEORGE ALLAN, Barnsheen, Ditton, Widnes. Chemist to Messrs. T. Vickers & Sons, Ltd., Phosphate Works, Widnes. B.Sc. (Dun.). A.I.C. Five years' laboratory and works experience with the United Alkali Co., Ltd., Widnes, in the manufacture of monochlorbenzene, chloracetic acid, and concentration of sulphuric acid, and subsequently two and a half years' (to date) experience with Messrs. T. Vickers & Sons, Ltd., Widnes, in the manufacture of sulphuric acid, Fertilisers and Phosphate of Soda, and in the corresponding analytical work. (*Signed by*) F. C. Garrett, J. A. Smythe, P. L. Robinson, John W. Towers, *John Hargreaves.*

SASTRY, M. SUBRAMANIA, 5, Krishnappa Naik Agraharam, Georgetown, Madras, India. Chemical Assistant, Government Leather Trades Institute, Madras. B.A. (Madras). Post Graduate Course for two and a half years (Madras University). Chemical Assistant. (*Signed by*) Kalyan C. Srinivasan, T. S. Natrajan, K. C. Viraraghavan, *S. N. Dhar.*

SEELEY, ERNEST ARTHUR, 10, Hamilton Road, London, N.5. Chemical Research Student. B.Sc. 1st Class Hons. Chem. (Lond.), A.R.C.S. (1st Chem.). D.I.C. (Organic Chemistry Research). (*Signed by*) Jocelyn Thorpe, C. K. Ingold, L. C. Nickolls.

SHAW, BRIAN DUNCAN, Ferns' Hollow, Station Road, Ilkeston. Student. Second Year Hon. Chem. Student (for B.Sc. Lond.) at University College, Nottingham. (*Signed by*) F. S. Kipping, F. C. Laxton, G. Green.

SMITH, ALBERT W., Case School of Applied Science, Cleveland, Ohio, U.S.A. Professor of Chemistry. Graduate of Chemical Dept. of Case School of Applied Science (B.S.). University of Zürich, Switzerland (Ph.D.). (*Signed by*) Olin F. Tower, Chas. F. Guhlmann, Chas. H. Herty.

STOTT, CLARENCE, Benroyd, Holywell Green, nr. Halifax. Works Chemist. (*a*) B.Sc. (Leeds); (*b*) A.I.C.; (*c*) Diploma in Gas Engineering (Leeds); (*d*) War Service: Army, 4½ years; B.E.F. France, 3½ years; rank: Capt. The last two years of service overseas were spent in Chemical Warfare as Gas Officer to the 49th (West Riding) Division. Honours: (1) Mentioned in Despatches; (2) Military Cross. (*e*) Works experience: 1¾ years' laboratory and plant experience with the Farnley Iron Co., nr. Leeds. (*Signed by*) John W. Cobb, Arthur Smithells, Herbert Ingle.

THOMAS, WILLIAM, Penfro, Stoneywood, Aberdeen. Lecturer in Chemistry, University, Aberdeen. M.Sc. (Wales). B.A. (Cantab.). A.I.C. (*Signed by*) Alex. Findlay, T. Harold Reade, Edward Bloom.

UNDERHAY, GEORGE FLAXMAN, Allerton, Woodside Avenue, Muswell Hill, N.10. Research at University College, London. 2nd Class Honours B.Sc. (Chemistry). Now engaged on research under Prof. F. G. Donnan, C.B.E., F.R.S., at University College. (*Signed by*) F. G. Donnan, J. N. Collie, Irvine Masson, O. L. Brady.

VARDY, WILLIAM ANDREW SHAKESPEARE, Winksley Vicarage, Ripon. Analytical Chemist, relinquished on account of ill-health. Late Student in Science and Member of Ripon G.S. Scientific Society. Analytical Chemist. (*Signed by*) A. Mortimer, Barker North, T. W. Price.

WALTERS, JOHN GEORGE, 46, Durham Road, East Finchley, N.2. Teacher. B.Sc. (London). Senior Chemistry Master, County Secondary School, Hendon, N.W.4. Late Commandant XVII Corps Gas School, B.E.F., and Chemical

Adviser XVII Corps, B.E.F. (*Signed by*) T. J. Drakeley, P. Schidrowitz, Raymond R. Butler.

WATT, WILLIAM WALLACE, 29, Woodstock Road, Golders Green, N.W.4. Consulting Petroleum Technologist. Chief Chemist, Burmah Oil Co., Rangoon (13½ years). Technical Staff (London), Anglo-Persian Oil Co. (1½ years). Deputy Controller of Oil to H.M. Govt. of India (1 year). Technical Adviser Caltex Oil Co., London (1½ years). (*Signed by*) F. B. Thole, A. E. Dunstan, J. C. Crocker, F. Arnall.

WATSON, ARTHUR FREDERICK, Brockwell Hall, Herne Hill, S.E.23. Research Chemist. University College, London, 1913–15, 1919–21; B.Sc. (War) degree, 1917. B.Sc. (Honours Chemistry), 1920. A.I.C. 1921. Research in Biological Chemistry, 1920–1921. M.Sc. (Physiological Chemistry), 1921, London. (*Signed by*) J. C. Drummond, Irvine Masson, F. G. Donnan.

WILLIAMS, LLYWELYN, Herne Bay College, Kent. Assistant Master. B.Sc. (Wales) in Chemistry and Physics. My present appointment is that of Senior Science and Mathematics Master at Herne Bay College, Kent. (*Signed by*) T. Campbell James, C. R. Bury, L. J. Hudleston.

WOOD, HARRY ALEXANDER, Santa Elena, Entre Rios, Argentine Republic. Industrial Chemist. (*a*) Analytical Assistant to Prof. James Hendrick, B.Sc., F.I.C., Professor of Agriculture, Aberdeen University (3 years); (*b*) Analytical Assistant to Dr. J. F. Tocher, F.I.C., Public Analyst and Official Agricultural Analyst (3 years); (*c*) Works Chemist: Establecimientos Argentinos de Bovril Santa Elena, Entre Rios, Argentine Republic (1½ years). (*Signed by*) James Hendrick, J. F. Tocher, A. Searl.

The following Certificates have been authorised by the Council for presentation to ballot under Bye-law I (2):

BASU, HARILAL, Care of the Inspector-General of Civil Hospitals, Burma, Rangoon, Post Box No. 84. Civil Surgeon and District Public Health Officer of Yamethin District and Superintendent of Yamethin District Jail (Prison). L.M. & S. (Calcutta University). A good and successful student in the chemistry classes and always takes special interest in practical chemical work. Registered Medical Practitioner of the British Medical Council (London). Attended pulp making from bamboo for making of paper. Wants to do research work in chemistry. (*Signed by*) L. B. Seal, M. Hunter.

LAWRANCE, WALTER ALBERT, Lewiston, Maine, U.S.A. Professor of Chemistry, Bates College. Degrees: B.A., M.A. (McMaster); M.A., Ph.D. (Toronto). "Poly-nitro-compounds," *Proc. Royal Soc. Can.*, May 1918. "Friedel-Crafts' Reaction," *J. Am. Chem. Soc.*, Sept. 1920. "Friedel-Crafts' Reaction," *J. Am. Chem. Soc.*, Dec. 1921. "Friedel-Crafts' Reaction," *J. Am. Chem. Soc.* (in course of publication). (*Signed by*) W. Lash Miller.

ECHNOLOGY DEPT.

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PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, April 6th, 1922, at 8 p.m., PROFESSOR H. E. ARMSTRONG, LL.D., F.R.S., Vice-President, in the Chair.

Reference was made to the loss sustained by the Society, through death, of :

	Elected.	Died.
Philippe Auguste Guye (Honorary Fellow)	Mar. 7th, 1912.	Mar. 27th, 1922.
Seward Whiting Williams	June 18th, 1891.	Aug. 25th, 1921.

It was announced—

(1) That in order to commemorate the centenary of the birth of Pasteur the University and town of Strasbourg have decided to erect a statue facing the University where, as a professor, Pasteur commenced his career. The inauguration ceremonies, under the patronage of the President of the Republic and other distinguished men, will be held on May 1st, 1923, and will include the unveiling of the statue and the opening of an Exhibition of Hygiene and Bacteriology.

With the object of evincing the sympathy of this country with the project in view, a British Committee has been formed of the following : Chairman, Sir Charles Sherrington, G.B.E. (President of the Royal Society), Treasurer, Mr. A. Chaston Chapman, F.R.S. (President of the Institute of Chemistry), Mr. H. E. Field (President of the Institute of Brewing), Professor Percy F. Frankland, C.B.E., F.R.S., Sir John M'Fadyean, M.R.C.V.S., LL.D. (Principal of the Royal Veterinary College), Professor C. J. Martin, C.M.G., F.R.S. (Director of the Lister Institute), Sir William J. Pope, K.B.E., F.R.S., Sir James Walker, F.R.S. (President of the Chemical Society), and Sir Almroth Wright, K.B.E., F.R.S. (Principal of the Institute of Pathology and Research).

It is hoped there may be many British chemists desirous of contributing to the Memorial Fund. Contributions may be sent

to Monsieur Th. Héring, 6, Rue des Veaux, Strasbourg, or to Mr. A. Chaston Chapman, Institute of Chemistry, 30, Russell Square, W.C. 1. The subscription list will close about the end of next June.

Manufacturers and business firms in this country to whom the Exhibition may be of interest are cordially invited to offer assistance, and those able and willing to do so should communicate with Professor Borrel, 3, Rue Koeberlé, Strasbourg.

(2) That the following Committees for 1922—1923 had been appointed by the Council:

Finance Committee.—Messrs. E. F. Armstrong, A. Chaston Chapman, C. A. Hill, G. T. Moody, and the Officers.

House Committee.—Messrs. J. L. Baker, Sir Herbert Jackson, Alexander Scott, Sir William A. Tilden, E. W. Voelcker, and the Officers.

Library Committee.—Messrs. P. P. Bedson, O. L. Brady, Sir Thomas K. Rose, E. J. Russell, J. M. Thomson (Chairman), Sir William A. Tilden, the Editor, the Librarian, and Officers, together with the following representatives of contributing Societies: Messrs. J. L. Baker, C. Dorée, J. C. Drummond, A. Harden, C. A. Keane, R. L. Mond, and G. Senter.

Publication Committee.—Messrs. A. J. Allmand, O. L. Brady, C. H. Desch, I. M. Heilbron, J. T. Hewitt, J. C. Irvine, H. King, T. M. Lowry, J. W. McBain, R. H. Pickard, N. V. Sidgwick, J. F. Thorpe, and the Officers.

Research Fund Committee.—Messrs. H. B. Baker, D. L. Chapman, Sir James J. Dobbie, F. G. Donnan, G. G. Henderson, F. S. Kipping, R. H. Pickard, Sir William J. Pope, R. Robinson, S. Smiles, and the Officers.

The following were formally admitted Fellows of the Chemical Society: H. B. Courtney and G. Thompson.

Certificates were read for the first time in favour of:

George Baborovský, Ph.D., Falkensteinerova ul. 7, Brno, Czecho-Slovakia.
Stanley John Bailey, B.A., The Braes, South Nutfield, Redhill.
Robert Stanley Colborne, B.Sc., A.R.C.S., 57, County Road, Swindon.
James Brierley Firth, D.Sc., F.I.C., 44, Lucknow Avenue, Mapperley Park, Nottingham.
Dorothea Annie Hoffert, 50, Hampstead Way, N.W. 11.
Ralph Henry Parker, Radio House, Wilson Road, Smethwick, Staffs.
Edmond Samuels, 40, Castlereagh Street, Sydney, N.S.W.
Ronald William Stevenson, M.C., M.A., Eaglehurst, Ditton Hill, Surbiton.

A Certificate has been authorised by the Council for presentation to ballot under Bye-Law I (2) in favour of:

Robert Swainson-Hall, Government Plantations Department, Victoria, British Cameroons, West Africa.

The following papers were read :

"Constitution of picrorocellin, a nitrogenous constituent of *Roccella fuciformis*." By M. O. FORSTER and W. B. SAVILLE.

"The determination of surface tension from the maximum pressure in bubbles." By S. SUGDEN.

"The variation of refractive index and specific gravity of benzene with temperature." By W. B. PARKER and G. THOMPSON.

"The influence of substituents on the formation and stability of heterocyclic compounds. Part I. Hydantoins." By C. K. INGOLD, S. SAKO, and J. F. THORPE.

ORDINARY SCIENTIFIC MEETING.

The next Ordinary Scientific Meeting will be held on Thursday, May 4th, 1922, at 8 p.m., when a ballot for the election of Fellows will be held.

INFORMAL MEETING.

The next Informal Meeting will be held on Thursday, May 18th, 1922, after the conclusion of the formal business of the Ordinary Scientific Meeting, to be held at 8 p.m.

RESEARCH FUND COMMITTEE.

A meeting of the Research Fund Committee will be held in June next. Applications for Grants, to be made on forms which can be obtained from the Assistant Secretary, Chemical Society, Burlington House, W. 1., must be received on or before Thursday, June 1st, 1922.

All persons who receive grants in June, 1921, or in June of any previous year, whose accounts have not been declared closed by the Council, are reminded that reports must be returned by Thursday, June 1st.

SETS OF THE BERICHTE AND OF THE ZENTRALBLATT.

The Society still has a few remaining sets of the *Berichte* and of the *Zentralblatt* from August, 1914, to December, 1920, inclusive, for disposal. These can be obtained, in complete sets only, from the Assistant Secretary, price £10 per set of the *Berichte*, and of the *Zentralblatt*.

The number of sets is strictly limited and application should be made without delay.

LIST OF FELLOWS, 1922.

The Council has decided to supply the List of Fellows for 1922 to those Fellows only who make application to the Assistant Secretary before August 31st, 1922.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

CORNUBERT, R. Dictionnaire Anglais-Français-Allemand : de mots et locutions intéressant la physique et la chimie. Paris 1922. pp. xxxii + 298. 42 *fr.* (*Reference.*)
From the Publisher : M. Dunod.

HALE, ARTHUR JAMES. Modern chemistry, pure and applied. Vol. IV. London [1922]. pp. viii + 280. ill. 16*s.* net. (*Recd.* 31/3/22.) From the Publishers : Messrs. Virtue & Co.

IMPERIAL INSTITUTE. Indian Trade Enquiry. Reports on lac, turpentine, and rosin. London 1922. pp. x + 74. 5*s.* net. (*Recd.* 1/4/22.) From the Director.

IMPERIAL MINERAL RESOURCES BUREAU. Laws and regulations relating to lead poisoning : being an analysis with texts of the laws and regulations made in the chief industrial countries to prevent plumbism. By GILBERT STONE. London 1922. pp. 247. (Two copies.) 5*s.* net. From the Bureau.

INDIAN SCIENCE CONGRESS. Handbook for the use of members attending the ninth meeting to be held at Madras . . . 1922. Madras 1921. pp. x + 166. (*Recd.* 21/3/22.)
From Captain Clive Newcomb.

LOWRY, THOMAS MARTIN. Inorganic chemistry. London 1922. pp. xii + 944. ill. 28*s.* net. (*Recd.* 30/3/22.)
From the Author.

MINISTRY OF MUNITIONS and DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH. Technical records of explosives supply 1915–1918. No. 8. Solvent recovery. London 1921. pp. iv +22. ill. 3*s.* net. (*Recd.* 10/4/22.) From the Department.

MONIER-WILLIAMS, GORDON WICKHAM. Power alcohol : its production and utilisation. London [1922]. pp. xii + 324. ill. 21*s.* net. (*Recd.* 10/4/22.)
From the Publishers : Messrs. Henry Frowde and Hodder & Stoughton.

SCIENTIFIC AND INDUSTRIAL RESEARCH, Department of. *Fuel Research Board.* A handbook on the winning and utilisation of peat. By A. HAUSDING. Translated from the 3rd German edition by HUGH RYAN. London 1921. pp. xxiv + 506. ill. 30*s.* net. (*Recd.* 16/3/22.) From the Department.

SHERMAN, HENRY CLAPP, and SMITH, SYBIL L. The vitamins. New York 1922. pp. iv + 274. ill. $4 net. (*Recd.* 21/3/22.)
From the Publishers: The Chemical Catalogue Company, Inc.

VENABLE, FRANCIS P. Zirconium and its compounds. New York 1922. pp. 1–10, 15–174. $2·50 net. (*Recd.* 30/3/22.)
From the Publishers: The Chemical Catalogue Company, Inc.

II. *By Purchase.*

ASTON, FRANCIS WILLIAM. Isotopes. London 1922. pp. viii + 152. ill. 9*s.* net. (*Recd.* 14/3/22.)

BODFORSS, SVEN. Die Aethylenoxyde. Ihre Darstellung und Eigenschaften. (Sammlung, Vol. XXVI.) Stuttgart 1920.

BÖCKMANN, FRIEDRICH. Celluloid: its raw material, manufacture, properties and uses. 2nd English edition, translated from the 3rd German edition by HERBERT BIRTWHISTLE STOCKS. London 1921. pp. viii + 188. ill. 8*s.* 6*d.* net. (*Recd.* 16/3/22.)

CHAPMAN, ALFRED CHASTON. Einige Fortschritte auf dem Gebiete der analytischen Chemie. Translated by OSKAR BAUDISCH. (Sammlung, Vol. XXVI.) Stuttgart 1921.

DONATH, EDUARD, and LISSNER, A. Kohle und Erdöl. (Sammlung, Vol. XXVI.) Stuttgart 1920.

FUNK, CASIMIR. The vitamines. Translated from the 2nd German edition by HARRY E. DUBIN. Baltimore 1922. pp. 502. ill. 31*s.* 6*d.* net. (*Recd.* 9/3/22.)

GROSSMANN, HERMANN, and WRESCHNER, MARIE. Die anomale Rotationsdispersion. (Sammlung, Vol. XXVI.) Stuttgart 1921.

HAHN, FRIEDRICH-VINCENZ VON. Ueber die Herstellung und Stabilität kolloider Lösungen anorganischer Stoffe. (Mit besonderer Berücksichtigung der Sulfidsole.) (Sammlung, Vol. XXVI.) Stuttgart 1922.

HATSCHEK, EMIL. An introduction to the physics and chemistry of colloids. 4th edition. London 1922. pp. xiv + 172. ill. 7*s.* 6*d.* net. (*Recd.* 16/3/22.)

HURST, GEORGE H. Soaps: a practical manual on the manufacture of domestic, toilet, and other soaps. 3rd edition. By HERBERT BIRTWHISTLE STOCKS. London 1922. pp. viii + 432. ill. 21*s.* net. (*Recd.* 14/3/22.)

JONES, LLEWELLYN, and SCARD, FREDERIC ISENBART. The manufacture of cane sugar. 2nd edition. London [1921]. pp. xx + 482. ill. 25*s*. net. (*Recd.* 16/3/22.)

JULIAN, H. FORBES, and SMART, EDGAR. Cyaniding gold and silver ores. 3rd edition. By A. W. ALLEN. London 1921. pp. xxiv + 418. ill. 36*s*. net. (*Recd.* 16/3/22.)

MEADE, ALWYNE. Modern gasworks practice. 2nd edition. London 1921. pp. xii + 816. 55*s*. net. (*Recd.* 14/3/22.)

MELLOR, JOSEPH WILLIAM. A comprehensive treatise on inorganic and theoretical chemistry. Vols. I and II. London 1922. pp. xvi + 1066, viii + 894. ill. (*Reference.*) £6 6*s*. net.

NEUBURGER, MAXIMILIAN CAMILLO. Das Problem der Genesis des Actiniums. (Sammlung, Vol. XXVI.) Stuttgart 1921.

—— Neuere Ergebnisse der Forschung über die Radioaktivität des Kaliums und Rubidiums im letzten Dezennium. (Sammlung, Vol. XXVI.) Stuttgart 1921.

PFEIFFER, PAUL. Organische Molekülverbindungen. (Chemie in Einzeldarstellungen, Vol. XI.) Stuttgart 1922. pp. xiv + 328. (*Recd.* 14/3/22.)

REDWOOD, SIR BOVERTON. Petroleum. 3 vols. 4th edition. London 1922. pp. xxx + 1353. ill. £5 5*s*. net. (*Recd.* 10/3/22.)

SIMMONS, WILLIAM HERBERT, and MITCHELL, CHARLES AINSWORTH. Edible fats and oils: their composition, manufacture, and analysis. 2nd edition. London 1921. pp. viii + 190. ill. 10*s*. 6*d*. net. (*Recd.* 16/3/22.)

YOUNG, SYDNEY, and others. Distillation principles and processes. London 1922. pp. xiv + 510. ill. 40*s*. net. (*Recd.* 14/3/22.)

ZEITSCHRIFT FÜR LEDER- UND GERBEREI-CHEMIE. Vol. I., etc. Hamburg 1922 +. ill. (*Reference.*)

III. *Pamphlets.*

ALEXANDER, ELIZABETH H. A bibliography of John Ferguson. (From the *Trans. Glasgow Bibliographical Soc.*, with alterations.) 1920. ill.

IMPERIAL MINERAL RESOURCES BUREAU. The Mineral Industry of the British Empire and Foreign Countries. War Period. Lead. (1913–1919.) London 1922. pp. 95.

—— —— Platinum and allied metals. (1913–1919.) London 1922. pp. 84.

—— —— Tin. (1913–1919.) London 1922. pp. 98.

INSTITUTE OF CHEMISTRY OF GREAT BRITAIN AND IRELAND. Lecture on modern applications of chemistry to crop production. By EDWARD JOHN RUSSELL. London 1922. pp. 23. ill.

MIALL, STEPHEN. The structure of the atom : notes on some recent theories. London 1922. pp. vi + 26. ill.

TADOKORO, TETSUTARO. On the spectrochemical reaction of methylfurfurol- and oxymethylfurfurol phloroglucid. (From the *J. Coll. Agric., Hokkaido Imp. Univ.*, 1921, **10**.) ill.

—— Ultraviolet spectroscopical studies on the antagonistic action of salts in organic colloidal solution. (From the *J. Coll. Agric., Hokkaido Imp. Univ.*, 1921, **10**.) ill.

SCIENCE DEPT.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, May 4th, 1922, at 8 p.m., Professor J. F. THORPE, C.B.E., F.R.S., Vice-President, in the Chair.

The CHAIRMAN referred to the loss sustained by the Society, through death, of the following Fellows:

	Elected.	Died.
Sir William Phipson Beale	Dec. 5th, 1867.	April 13th.
Joseph Albert Hughes	Dec. 3rd, 1908.	Jan. 9th.
Charles Mann Luxmoore	Feb. 16th, 1893.	April 16th.
James Morris	May 1st, 1919.	Mar. 31st.

The CHAIRMAN announced:

1. That the Council had sealed the following Address of Congratulation to be presented to the Royal University of Padua on the celebration of the Seven Hundredth Anniversary of its Foundation to be held on May 14th to 17th, 1922:

THE CHEMICAL SOCIETY

TO

THE RECTOR, SENATE, PROFESSORS AND ALUMNI

OF THE

ROYAL UNIVERSITY OF PADUA.

On behalf of the Chemical Society, we have the honour to convey our warmest felicitations on the celebration of the Seven Hundredth Foundation Anniversary of the Royal University of Padua.

The knowledge that your University flourished in the 13th century, that six hundred years ago it pointed the way of learning to the peoples—not only of Italy, but of Europe—and that inscribed on the roll of its learned professors in

science are to be found the immortal names of Galileo and Morgagni, is indeed an inspiration to the whole world. It is our earnest wish that the lamp of learning, kindled so long ago in your ancient University, may continue to burn with increasing radiance.

In the name of the Fellows and Council of the Chemical Society we welcome this happy opportunity of recording our deep appreciation of the commanding position achieved by your University in the advancement of knowledge, uniting therewith our most sincere wishes for the continued prosperity of this illustrious and venerable seat of learning.

Signed on behalf of the Council of
The Chemical Society.

JAMES WALKER, President.
M. O. FORSTER, Treasurer.
L.S.
IRVINE MASSON, } Secretaries.
JAMES C. PHILIP, }
ARTHUR W. CROSSLEY, Foreign Secretary.

Sealed in Council this Fourth day of May, One Thousand Nine Hundred and Twenty-Two.

2. That Mr. G. H. Gabb had presented to the Society's collection a medal of Joseph Priestley, executed by Halliday about 1804. The inscription on the reverse of the medal is taken from the tablet erected in the new Meeting House, Birmingham, to the memory of Priestley and was written by Dr. Parr.

The following were formally admitted Fellows of the Chemical Society: P. Appleyard, K. A. Burke, M. H. Cocks, K. J. Isaac, L. O. Kekwick, and H. L. Saunders.

Certificates were read for the first time in favour of:

Frank Belton, B.Sc., Athlone, Bush Hill Park, Enfield.
Robert Keith Cannan, M.Sc., 4, Antrim Mansions, N.W. 3.
Bibhu Charan Chatterjee, M.Sc., University College of Science, 92, Upper Circular Road, Calcutta, India.
Shiavaksha Hormasji, Contractor, Karanjia Building, opp. Moos Building, Grant Road, Bombay, India.
Margaret White Fishenden, D.Sc., 19, Shepherd's Hill, Highgate, N. 6.
Frederick Walter Goddard, M.A., 12, College Street, Winchester.
Edmund Langley Hirst, M.A., B.Sc., Ph.D., Ainslie Villa, Largo Road, St. Andrews.
William Job Jenkins, 37, Marston Road, Knowle, Bristol.
Peppo Joseph Levy, 42, Granville Gardens, Shepherd's Bush, W. 12.
David McCall, B.Sc., 4, Lime Street, Dundee.
Richard Edmund Anthony Mallet, B.A., Redford, Ockley, Surrey.

Ronald George Wreyford Norrish, B.A., Emmanuel College, Cambridge.
John Goodrich Oats, 3, Montpelier Terrace, Ilfracombe.
Claude Bernard Meister Platt, M.B.E., Middleton House, Beckett Road, Doncaster.
Arthur Plowman, B.Sc., A.R.C.S., A.I.C., 8, Rowantree Road, Bycullah Park, Enfield.
John Pryde, B.Sc., 4, Gowrie Street, Blackness Avenue, Dundee.
Juda Hirsch Quastel, B.Sc., A.R.C.S., A.I.C., Trinity College, Cambridge.
John Charles Smith, B.Sc., 31, Bidwell Street, Wellington, N.Z.
Valerie Emeline Sophie Swainson, B.Sc., 21, Hungerford Road, N. 7.
Nowroji Jamshedji Vazifdar, 17, Queens Road, opp. Charin Road Station, Bombay, India.
George William Wigg, 72nd Northumbrian Bde., R.F.A., Barrack Road, Newcastle-on-Tyne.

Messrs. C. Gilling and J. Reilly were elected Scrutators, and a ballot for the election of Fellows was held. The following were subsequently declared elected as Fellows:

Brojo Kishore Banerjee, B.Sc.
Benoy Bhusan Basu, B.Sc., M.B.
Harilal Basu.
George Macdonald Bennett, M.A., M.Sc., F.I.C.
John William Blagden, M.A., Ph.D., F.I.C.
Frederick Mason Brewer.
Eric Sykes Brooks.
Fred Brumfitt.
Carlton Butler, B.Sc., A.I.C.
Charlie Lyons Carter, M.Sc., A.I.C.
Arthur Rockett Chadwick.
Leslie Ashburn Dunn.
Richard Fisher.
Francis Arthur Freeth, M.Sc., F.I.C.
Alfred Duncan Gay.
Douglas Creese Harrison, B.Sc.
Thomas Weatherill Harrison, B.Sc., F.I.C.
Henry Unwin Harrow.
Douglas Cecil Henry, M.A.
Herbert Hodgson.
Eusebius Holmes, B.Sc.
William Hurst.
Thomas Iredale, B.Sc.
Ethel Mary James, B.Sc.
George Lewis Kennaby, B.Sc.
Walter Albert Lawrance, M.A., Ph.D.
Edward Ingleson Lawson.
Arthur Cyric Percy Lunn, B.A.
Robert Craig McDowall.
Lingaiah Basavalingaiah Manjunath, B.A.
John Mylne Mullaly.
Harold Edward Charles Powers, B.Sc.
Akella Suryanarayana Rao, B.Sc.
Harry Lister Riley, B.Sc.
James Robinson, B.Sc.
George Allan Russell, B.Sc., A.I.C.
M. Suhramania Sastry, B.A.
Ernest Arthur Seeley, B.Sc.
Brian Duncan Shaw.
Albert William Smith, B.Sc., Ph.D.
Clarence Stott, B.Sc., A.I.C.
William Thomas, B.A., M.Sc., A.I.C.
George Flaxman Underhay, B.Sc.
William Andrew Shakespeare Vardy.
John George Walters, B.Sc.
Arthur Frederick Watson, M.Sc., A.I.C.
William Wallace Watt.
Llywelyn Williams, B.Sc.
Harry Alexander Wood.

The following papers were read:

"On dopplerite. Studies in the composition of coal." By F. V. Tideswell and R. V. Wheeler.

"Bromo-derivatives of glyoxaline." By I. E. Balaban and F. L. Pyman.

"The properties of ammonium nitrate. Part IV. The reciprocal salt-pair $NH_4NO_3+NaCl \rightleftarrows NH_4Cl+NaNO_3$." By E. P. PERMAN.

"The reactivity of ammonia." By E. C. C. BALY and H. M. DUNCAN.

"Photocatalysis. Part II. The photosynthesis of nitrogen compounds from nitrates and carbon dioxide." By E. C. C. BALY, I. M. HEILBRON, and D. P. HUDSON.

Ordinary Scientific Meeting, Thursday, May 18th, 1922, at 8 p.m., SIR JAMES WALKER, D.Sc., F.R.S., President, in the Chair.

Reference was made to the loss sustained by the Society, through death, of:

	Elected.	Died.
Adolphus Collenette	March 1st, 1883.	May 7th, 1922.

The following were formally admitted Fellows of the Chemical Society: G. M. Bennett and J. G. Mitchell.

Certificates were read for the first time in favour of:

Harry Baines, B.Sc., 22, Henry Road, West Bridgford, Nottingham.
Victor Cecil Branson, B.Sc., A.R.C.S., A.I.C., Messrs. Naparma Oilfields, Ltd., San Fernando, Trinidad, B.W.I.
Albert Hassell, 47, Stanley Street, Tunstall, Stoke-on-Trent.
Edith Annie Peach, 43, St. Gabriel's Road, Cricklewood, N.W.2.
Clifford Dane Thomas, B.Sc., 10, Lansdowne Place, Blackheath, S.E.10.

The following Certificate has been authorised by the Council for presentation to ballot under Bye-law I (2):

Walter Herbert Fulweiler, B.Sc., c/o The United Gas Improvement Co., Philadelphia, Pa., U.S.A.

The meeting was then adjourned and the Informal Meeting declared open. A selection of autograph letters from the Roscoe collection and of books of historical interest from the Library was exhibited.

LECTURE.

At the Ordinary Scientific Meeting to be held on Thursday, June 8th, 1922, at 8 p.m., in the Lecture Hall of the Institution of Mechanical Engineers, Storey's Gate, S.W.1, Dr. H. H. Dale, C.B.E., F.R.S., will deliver his Lecture entitled: "Chemical and Physiological Properties."

LIST OF FELLOWS, 1922.

The Council has decided to supply the List of Fellows for 1922 to those Fellows only who make application to the Assistant Secretary before August 31st, 1922.

List of Papers received between April 7th and May 18th, 1922 :

"A synthesis of *iso*brazilein and certain related anhydropyranol salts. Part II. Synthesis of *iso*hæmatein." By H. G. CRABTREE and R. ROBINSON.

"Studies in catalysis. Part XVI. The inversion of sucrose by hydrogen ion." By T. MORAN and W. C. McC. LEWIS.

"2-*p*-Dimethylaminostyrylpyridine methiodide, a new photographic sensitiser." By W. H. MILLS and W. J. POPE.

"On dopplerite. Studies in the composition of coal." By F. V. TIDESWELL and R. V. WHEELER.

"Bromo-derivatives of glyoxaline." By I. E. BALABAN and F. L. PYMAN.

"The oxidation of hexadecane and saturated fatty acids by air or oxygen." By A. H. SALWAY and P. N. WILLIAMS.

"Estimation of lead peroxide." By C. RAMASOMAYAJULU.

"Dyes derived from phenanthraquinone (naphthaflavindulines)." By S. C. DATTA.

"Researches on sulphuryl chloride. Part II. A new chlorinating agent; preparation of poly-chloro-derivatives of benzene." By O. SILBERRAD.

"The decomposition of benzyl disulphoxide." By J. A. SMYTHE.

"The use of iron pyrites in a Friedel-Crafts' reaction." By J. A. SMYTHE.

"The properties of ammonium nitrate. Part IV. The reciprocal salt-pair, $NH_4NO_3 + NaCl \rightleftharpoons NH_4Cl + NaNO_3$." By E. P. PERMAN.

"The reactivity of ammonia." By E. C. C. BALY and H. M. DUNCAN.

"Photocatalysis. Part II. The photosynthesis of nitrogen compounds from nitrates and carbon dioxide." By E. C. C. BALY, I. M. HEILBRON, and D. P. HUDSON.

"Attempts to prepare red sulphide dyes. Part I." By E. R. WATSON and S. DUTT.

"Limits for the propagation of flame in vapour–air mixtures. Part I. Mixtures of air and one vapour at the ordinary temperature and pressure." By A. G. WHITE.

"Studies on hypophosphorous acid. Part IV. Its reaction with cupric chloride." By A. D. MITCHELL.

"The labile nature of the halogen atom in organic compounds. Part III. The absorption spectra of bromomalonic derivatives and nitroparaffins, and their bearing on the question of an oxygen–halogen linking." By H. Graham and A. K. Macbeth.

"The labile nature of the halogen atom in organic compounds. Part IV. The tautomeric hydrogen hypothesis and the removal of the halogen atom from aromatic nitro-compounds." By A. K. Macbeth.

"The action of sulphur on cuprous chloride." By F. W. Pinkard and W. Wardlaw.

"Dyes derived from phenanthraquinone. Part I. Phenanthranaphthazines." By A. C. Sircar and S. B. Dutt.

"Physical chemistry of the oxides of lead. Part IV. Red lead and lead sesquioxide." By S. Glasstone.

"The sulphilimines, a new class of organic compounds containing quadrivalent sulphur." By F. G. Mann and W. J. Pope.

"The aldehydo-salicyclic acids and their derivatives." By E. J. Wayne and J. B. Cohen.

"The effect of an electrolyte on solutions of pure soap. Phase rule equilibria in the system sodium laurate–sodium chloride–water." By J. W. McBain and A. J. Burnett.

"Investigations into the analytical chemistry of tantalum, columbium, and their mineral associates. Part III. A critical study of the volumetric estimation of columbium." By W. R. Schoeller and E. F. Waterhouse.

"Mercury compounds of hydroxybenzaldehydes." By T. A. Henry and T. M. Sharp.

"*iso*Quinoline and the *iso*quinoline-reds." By J. E. G. Harris and W. J. Pope.

"Studies in optically active dyes. Part I. Camphoreins." By B. K. Singh, R. Rai, and R. Lal.

"The hydroferrocyanides and hydroferricyanides of the organic bases." Part I. By W. M. Cumming.

"The viscosity of cellulose in cuprammonium hydroxide solution. Part I. The determination of the viscosity." By R. A. Joyner.

"The oxidising and reducing properties of sulphur dioxide. Part IV. Mercury chlorides." By L. M. Stewart and W. Wardlaw.

"The conditions underlying the formation of unsaturated and cyclic compounds from halogenated open-chain derivatives. Part IV. Products formed from halogen derivatives of muconic acid. The constitution of muconic acid." By J. P. C. Chandrasena and C. K. Ingold.

"Studies in the coumaranone series. Part II. The preparation of 6- and 4-chlorocoumaran-2-ones and their conversion into 4- and 2-chloroflavanols respectively and some derivatives of *o*- and *p*-chlorophenoxyacetic acids." By T. H. MINTON and H. STEPHEN.

"The preparation of *o*-, *m*-, and *p*-nitrophenoxyacetic acids and various nitrotolyloxyacetic acids and their derivatives." By T. H. MINTON and H. STEPHEN.

"Some properties of hydrogen desorbed from platinum and palladium." By P. ANDERSON.

"The reactivity of doubly-conjugated unsaturated ketones. Part III. Unsymmetrical hydroxy- and methoxy-derivatives." By J. S. BUCK and I. M. HEILBRON.

"Phenopyryllium salts of distyryl ketones. Part I." By J. S. BUCK and I. M. HEILBRON.

"The mathematics of the dicyclic colour theory and a new theory of the nitrogen atom." By J. MOIR.

"Physical chemistry of the oxides of lead. Part V. The electromotive behaviour of lead dioxide." By S. GLASSTONE.

"Studies of the constitution of soap solutions. Sodium behenate and sodium nonylate." M. TAYLOR.

"Studies in the anthracene series. Part II." By E. DE B. BARNETT and J. W. COOK.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

ACTUALITÉS DE CHIMIE CONTEMPORAINE. Publiées sous la direction de A. HALLER. 1st series. Paris 1922. pp. viii + 326. ill. 12 *fr.* (*Recd.* 11/4/22.)

From the Publisher: M. Gaston Doin.

IMPERIAL MINERAL RESOURCES BUREAU. The Mineral Industry of the British Empire and Foreign Countries. War Period. Copper (1913—1919). London 1922. pp. 204. 4*s.* net. (*Recd.* 1/5/22.)

—— —— Gold (1913—1919). London 1922. pp. 366. 6*s.* net. (*Recd.* 11/4/22.) From the Bureau.

PURVIS, JOHN EDWARD, and HODGSON, THOMAS REGINALD. The chemical examination of water, sewage, foods and other substances. 2nd edition. Cambridge 1922. pp. viii + 346. 20*s.* net. (*Recd.* 3/5/22.) From the Syndics, Cambridge University Press.

STALEY, RALPH. Town gas manufacture: a practical introductory treatment of the equipment and processes of an average gas works. London 1922. pp. xii + 108. ill. 2*s.* 6*d.* net. (*Recd.* 1/5/22.) From the Publishers: Sir Isaac Pitman & Sons.

II. *By Purchase.*

SAINTE-CLAIRE DEVILLE, ÉMILE. Manuel de chimie gazière : méthodes et procédés des essais et analyses en usage à l'usine expérimentale de la villette de la Société du Gaz de Paris. Paris 1921. pp. viii + 208. ill. (*Recd.* 2/5/22.)

TRIVELLI, ADRIAAN PETER HERMAN, and SHEPPARD, SAMUEL EDWARD. The silver bromide grain of photographic emulsions. Rochester, N.Y. 1921. pp. 144. ill. 16*s.* net. (*Recd.* 1/5/22.)

VRIES, OTTO DE. Estate rubber : its preparation, properties and testing. Batavia 1920. pp. xii + 650. ill. 40*s.* net. (*Recd.* 2/5/22.)

WILLGERODT, CONRAD. Die organischen Verbindungen mit mehrwertigem Jod. (Chemie in Einzeldarstellungen, Vol. VII.) Stuttgart 1914. pp. xii + 266. (*Recd.* 2/5/22.)

ZEITSCHRIFT FÜR LEDER- UND GERBEREI-CHEMIE. Vol. I, etc. Hamburg 1921 +. ill. (*Reference.*)

ZEITSCHRIFT FÜR PFLANZENERNÄHRUNG UND DÜNGUNG. A. Wissenschaftlicher Teil. B. Wirtschaftlich-Praktischer Teil. Vol. I, etc. Leipzig 1922 +. (*Reference.*)

CERTIFICATES OF CANDIDATES FOR ELECTION AT THE BALLOT TO BE HELD AT THE ORDINARY SCIENTIFIC MEETING ON THURSDAY, JUNE 15TH, 1922.

N.B.—The names of those who sign from "General Knowledge" are printed in *italics*.

BABOROVSKÝ, GEORGE, Ph.D. (Prague), Brno, Falkensteinerova, ul. 7. Professor in the Technical High School of Brno, Tchechoslowackia. Member of the Société chimique de France, Tchechoslowack Chemical Society, formerly member of the American Electrochemical Society, formerly Professor in the University of Prague. 1900–1905 assistant, 1905–1911 lecturer in physical chemistry; 1911–1912 professor of physical chemistry in the Czech University of Prague; since 1912 professor of physical chemistry in the Czech Technical High School of Brno. Publications on different physico-chemical and electrochemical subjects in following periodicals: *Bulletin of the Czech Acad. of Science, Zeit. f. phys. Chem., Zeit. f. Elektrochem., Phys. Zeitschr., Chem. Listy.* Books: "Electrochemistry" (with Prof. F. Plzák), "Theoretical and Physical Chemistry" (1920) (boh.). (*Signed by*) Gerald Druce, A. Šimek, J. Heyrovský.

BAILEY, STANLEY JOHN, The Braes, South Nutfield, Surrey. Student (Cambridge University), Natural Science Tripos, Part I, in 1921, including Chemistry. (*Signed by*) T. Martin Lowry, Alfred Greeves, Hamilton McCombie, William J. Pope.

BAINES, HARRY, 22, Henry Rd., West Bridgford, Notts. British. Research Student. B.Sc. (Lond.), external, 1st Class Hons. in Chemistry. Now engaged on research course. (*Signed by*) F. Stanley Kipping, S. J. Pentecost, F. C. Laxton.

BELTON, FRANK, "Athlone," Bush Hill Park, Enfield. Headmaster, County Secondary School, Edmonton, N.9. (1) B.Sc. (London), Chemistry at Final Exam. (2) Studied chemistry at the Royal Technical College, Salford; with a short course at the Royal College of Science, London. (3) Head of Science Dept. and teacher of chemistry, Central Higher Grade School, Salford. (4) Author of text-books on physics and chemistry. (*Signed by*) B. Prentice, E. Clark, E. Green.

BRANSON, VICTOR CECIL, Naparma Oilfields, Ltd., San Fernando, Trinidad, B.W.I. Analytical Chemist. A.R.C.Sc. (1st class chemistry), B.Sc. Lond. (1st class honours in Chemistry), A.I.C. Chemist to the Naparma Oilfields, Ltd., since Jan. 1920. (*Signed by*) L. H. Parker, James C. Philip, H. B. Baker.

CANNAN, ROBERT KEITH, 4, Antrim Mansions, N.W.3. Assistant in Biochemistry, University College, London. Several papers in *Biochemical Journal* and *Journal of Physiology*. M.Sc. (Lond.) in Biochemistry. (*Signed by*) J. C. Drummond, R. H. A. Plimmer, Irvine Masson.

CHATTERJEE, BIBHU CHARAN, Ariadah, 24, Perganas, Bengal. Research Scholar in Chemistry. B.Sc. (Hons. in Chemistry), 1919; M.Sc. in Chemistry, 1921; first in Class I; conducted a piece of research work in organic chem. entitled, "On carbamic esters; chlorine as a simultaneous oxidising and chlorinating agent"; Sir T. N. Palit Research Scholar in Chemistry, Calcutta University. (*Signed by*) P. C. Rây, R. L. Datta, J. N. Mukherjee.

COLBORNE, ROBERT STANLEY, 57, County Road, Swindon. Research Student in Physical Chemistry (Imperial College, London). Student at Imperial College since 1919 (Oct.); A.R.C.S. (1st Class) 1921 (July); B.Sc. (Hons. 1st Class) 1921 (Nov.). (*Signed by*) H. B. Baker, M. A. Whiteley, James C. Philip, H. J. T. Ellingham.

CONTRACTOR, SHIAVAKSHA HORMASJI, F.N.B.A., F.S.Sc. (Lond.), Karanjia Building, opp. Moos Building, Grant Rd., Bombay. Scientist, Artist and Craftsman. Inventor of gold mirror glasses; Permanent blotters; Sizing Composition, etc. Recipient of 50 gold, silver, and bronze medals, and hundreds of diplomas at the world's various exhibitions. (*Signed by*) J. C. Mascarenhas, N. M. Bhathena, D. D. Kanga.

FIRTH, JAMES BRIERLEY, 44, Lucknow Avenue, Mapperley Park, Nottingham. Lecturer in Chemistry, University College, Nottingham. D.Sc. (Manc.), M.Sc. (Dunelm), F.I.C. Author or joint-author of some sixteen published researches, most of which have appeared in the *Journal of the Chemical Society*. (*Signed by*) F. S. Kipping, Henry Stephen, J. E. Myers, Colin Campbell, Norman Smith, Arnold Weston.

FISHENDEN, MARGARET WHITE, 19, Shepherds Hill, Highgate, N.6. Scientific Investigator for Fuel Research Board. 1909, B.Sc. (Manchester), 1st Class Honours Physics; 1919, D.Sc. Have published a number of papers on Meteorology (upper air) and conditions in weaving factories and spinning mills. Also the following: "The Coal Fire" (Special Report, No. 3, of Fuel Research Board). "The Efficiency of Low Temperature Coke in Domestic Appliances" (Technical Paper, No. 3, of Fuel Research Board). (*Signed by*) George Beilby, Harold B. Dixon, Frank Lee Pyman.

GODDARD, FREDERICK WALTER, 12, College St., Winchester. Assistant Master, Winchester College. M.A. (Cantab.); 1st Class Nat. Science Tripos

(1st Class Chemistry, Physics, Mineralogy); 1st Class Maths. Tripos, Pt. 1. War Service. Five years teaching Chemistry at Win. Coll. to Scholarship Candidates and post scholarship. Head of Chem. Dept., Win. Coll. (*Signed by*) Llewellyn L. Garbutt, D. Ll. Hammick, A. J. Berry.

HASSELL, ALBERT, 47, Stanley Street, Tunstall, Stoke-on-Trent. Science Master, Denstone College, Staffs. Chemistry Master, Denstone College, Staffs. I wish to obtain the Transactions so as to keep in touch with current chem. literature. (*Signed by*) Joseph West, H. V. Thompson, F. H. Clews.

HIRST, EDMUND LANGLEY, Ainslie Villa, Largo Rd., St. Andrews. Assistant in Chemistry Department, University of St. Andrews. Degrees: M.A., B.Sc., Ph.D. Assistant in Chemistry at St. Andrews University from October 1920. Publication: "The constitution of the disaccharides, Part V (Cellobiose)," by Walter Norman Haworth and Edmund Langley Hirst (T., 1921, **119**, 193). (*Signed by*) J. C. Irvine, R. Robinson, R. C. Menzies, A. Killen Macbeth.

HOFFERT, DOROTHEA ANNIE, 50, Hampstead Way, London, N.W.11. Research worker under the Food Investigation Board. 1916–1920, four years' experience in analytical and research work on dopes and varnishes for aeroplanes (war work). One year, 1920–1921, student in training for research, Cambridge University, with grant from Scientific and Industrial Research Department. (*Signed by*) William J. Pope, W. H. Mills, Charles T. Heycock, Frances M. Hamer, Ida Smedley Maclean, J. N. Goldsmith.

JENKINS, WILLIAM JOB, 37, Marston Road, Knowle, Bristol. Research Chemist. Plant chemist at H.M. Factory, Pembrey, 1915–1918. Research Chemist at Messrs. Nobels Ardeer Factory, 1920–1921. Research worker under Department of Scientific and Industrial Research, 1921–1922. (*Signed by*) Wm. Rintoul, N. Picton, R. A. Joyner, Wm. Barbour.

LEVY, PEPPO JOSEPH, 42, Granville Gardens, Shepherds Bush, London W.12. Spanish. Chemist (M.F.G.) intending. I am a student at the day school of Chemistry of the Polytechnic and wish to follow the latest developments in chemical science, and to use the Society's library. (*Signed by*) Frank E. Weston, W. H. Collier, Frank Matthews.

MCCALL, DAVID, 4, Lime Street, Dundee. Head of Pharmacy Dept., Technical College, Dundee. Degree of B.Sc. (St. Andrews), July 1919. Diploma of Pharmaceutical Chemist, April 1922. Member of Pharmaceutical Society of Gt. Britain. Lecturer on Botany, Pharmacy, and Materia Medica. Head of Pharmacy Dept., Technical College, Dundee, 1919. (*Signed by*) Alex. McKenzie, John S. Lumsden, John S. W. Boyle, John Foggie, H. J. Plenderleith.

MALLET, RICHARD EDMUND ANTONY, "Redford," Ockley, Surrey. Research Chemist. B.A. of Oxford University. Honours degree passed with distinction. Now employed as chemist at the British Museum. Have been engaged in research work at Oxford with Prof. T. R. Merton, F.R.S. (*Signed by*) Alexander Scott, D. Ll. Hammick, C. N. Hinshelwood, H. R. Raikes, H. Hartley.

NORRISH, RONALD GEORGE WREYFORD, Emmanuel College, Cambridge, and 48, Kimberley Rd., Cambridge. Research Student in Photochemistry. Scholar of Emmanuel College, Cambridge. Natural Sciences Tripos, Part I, Class I. Natural Sciences Tripos, Part II Chemistry), Class I. Paper: "The Transition Elements and the Octet Theory," *Chem. News*, 1922, **124**, 16–22. My reason for seeking admission is that I hope to make the study of Chemistry my chief occupation and interest in life. (*Signed by*) W. J. Pope, W. H. Mills, Eric K. Rideal, T. M. Lowry.

OATS, JOHN GOODRICH (junr.), 3, Montpelier Terrace, Ilfracombe. Engineering Student at R. A. Lister & Co., Dursley. Also chemical student (private laboratory). Student of metallurgy, chemistry, and analysis; holding a diploma from the International Correspondence Schools, including the subjects: mathematics, physics, inorganic chemistry, qualit. analysis, quant. analysis, and the manufacture of iron and steel. (*Signed by*) F. Southerden, Alfred L. Grey, R. Barton, G. F. Hall, Ernest F. Hooper, Jas. Walker.

PARKER, RALPH HENRY, "Radio House," Wilson Rd., Smethwick, Staffs. Student in Electrical and Mechanical Engineering and allied subjects. Research Student. (1) Took the 3 years' course in physics (mechanics, heat, electricity, and magnetism) at the (full time) Junior Day Technical School, Smethwick, years 1915–1918. (2) For three years continued with part day classes, 2 years' evening tuition, also matriculation class in chemistry, Smethwick Municipal Tech. (3) Studying Organic Chemistry at present time (1922). I will endeavour to forward the interests of the Society to the best of my ability and endeavour to keep abreast with modern chemical science. (*Signed by*) Arthur Adams, Joseph Lones, J. H. Wood.

PEACH, EDITH ANNIE, 43, St. Gabriel's Road, Cricklewood, N.W.2. Student of Chemistry at University College, London. Desirous of receiving the *Journal* and of using the Library. (*Signed by*) Irvine Masson, F. G. Donnan, J. C. Drummond.

PLATT, CLAUDE BERNARD MEISTER, Captain, M.B.E., R.E., Middleton House, Beckett Rd., Doncaster. Colliery Chemist, and Fuel Technologist. Two years as assistant to Prof. R. V. Wheeler, D.Sc., F.I.C., F.C.S.; engaged on research on spontaneous combustion of coal, composition of coal, research on explosions in mines and general laboratory work at Home Office Experimental Station. 2nd year Imperial College of Science and Technology (interrupted by the war). During war engaged on Army Wireless Telegraphy. At present chemist to Doncaster Collieries Association, Ltd., and assistant to Hot and Deep Mines Research Committee of Dept. of Scientific and Industrial Research. Published in *Trans. Chem. Soc.*, 1913, **108**, 1713. M.Soc.C.I., A.M.I.Min.E. Twelve months' experience on technical side of boiler practice—especially as regards fuel combustion. (*Signed by*) R. Lessing, W. Payman, R. V. Wheeler.

PLOWMAN, ARTHUR, 8, Rowantree Rd., Bycullah Park, Enfield. Research Student. B.Sc. (Lond.), A.R.C.S., A.I.C. (*Signed by*) R. Winton West, G. A. R. Kon, E. H. Farmer.

PRYDE, JOHN, 4, Gowrie St., Blackness Ave., Dundee. Research Chemist, St. Andrews University, N.B. Degree: B.Sc. (Pure Science). 1851 Exhibition Research Scholar, 1921. Publication (with J. A. Hewitt): "Metabolism of Carbohydrates, Pt. I," *Biochem. J.*, XIV, 3 and 4, 395. (*Signed by*) J. C. Irvine, R. Robinson, R. C. Menzies, A. Killen Macbeth.

QUASTEL, JUDA HIRSCH, Trinity College, Cambridge. Research Student, Biochemical Dept., Cambridge. Obtained A.R.C.S. (Lond. First Cl.), June 1921; elected Associate of Institute of Chemistry, June 1921; obtained B.Sc. Hons. (Lond. First Cl.) in October 1921. Accepted as candidate for Ph.D. (Cambridge). I wish to receive the Society's publications and to take part in its activities. (*Signed by*) F. G. Hopkins, H. B. Baker, James C. Philip.

SAMUELS, EDMOND, 40, Castlereagh St., Sydney, N.S.W. Pharmaceutical Chemist. Chemistry course, Sydney University. 'Interested in preparation of pharmaceutical products for physicians' use. Originator of several

medicinal products. Member of Pharmaceutical Society of N.S.W.; member of Millions Club, N.S.W.; member of Justices Association, N.S.W. (*Signed by*) J. Laker Macmillan, G. Spurge, Francis L. Watt.

SMITH, JOHN CHARLES, 31, Bidwell Street, Wellington, N.Z. Student of Chemistry. B.Sc. (N.Z.) 1919–20. Thesis on "The Condensation of Phenolic Substances with Basic Imino-haloids," presented for the degree of M.Sc. (N.Z.), Nov. 1921. (*Signed by*) F. P. Worley, W. F. Short, A. H. Bowell.

STEVENSON, RONALD WILLIAM, M.C., M.A., Major, Eaglehurst, Ditton Hill, Surbiton, Surrey. Manufacturing Chemist, Analytical and Research work. Director, Messrs. Stevenson and Howell, Ltd., Manufacturing Chemists. M.A., Cambridge (Science). (*Signed by*) Arthur Hutchinson, William Stevenson, Vernon J. Tilley.

SWAINSON, VALERIE EMELINE SOPHIE, 21, Hungerford Rd., N.7. Secondary School teacher (teaching Chemistry up to Intermediate Standard). B.Sc. (Hons.) Lond. in Chemistry. Demonstrator (temporary), mainly in Inorganic Chemistry, for two terms, at University College, Dundee (Jan.–June, 1921). (*Signed by*) H. Crompton, M. S. Crewdson, J. F. Spencer.

THOMAS, CLIFFORD DANE, 10, Lansdowne Place, Blackheath, S.E.10. British. Research Chemist. Second Class Honours, B.Sc., 1920. One year's research under Dr. O. L. Brady at University College, 1920–1921. Junior Research Assistant at Research Dept., Woolwich. (*Signed by*) Eustace E. Turner, Sydney A. Pearman, W. J. Powell.

VAZIFDAR, NOWROJI JAMSHEDJI, 17, Queens Road, Opp. Charin Road Station, Bombay. First Assistant Chemical Analyser to Government. L.M. & S. Bombay. Teacher in Chemistry, Grant Medical College, Bombay. Chemical analyser to Govt. for Sind, Karachi, 1914–15; 1916–17. Author of "Physiology of the Nervous System and Special Senses." Coach in physiology for the last 15 years. (*Signed by*) D. D. Kanga, M. J. Gajjar, K. G. Naik.

WIGG, GEORGE WILLIAM, 72nd Northumbrian Bde., R.F.A., Barrack Rd., Newcastle-on-Tyne. Lt., R.F.A. 4th–5th year medical student, University of Durham, College of Medicine. 3rd year honours chemistry student, Armstrong college, Newcastle-on-Tyne. (*Signed by*) W. N. Haworth, Frank M. Irvine, D. Arthur Ruell.

The following Certificates have been authorised by the Council for presentation to ballot under Bye-law I (2):

HALL, ROBERT SWAINSON, F.L.S., F.A.M.S., c/o Govt. Plantations Dept., Victoria, British Cameroons, West Africa. Supt. of agriculture to Nigerian Government. Three years' training in chemistry, Waterloo Secondary School, Oldham, Lancs. Four years' practical experience in agricultural chemistry in Portuguese Congo, S.W. Africa. Contribution to science mostly on mycological and agricultural matter; see *Kew Bulletin*, *Bull. of Imperial Institute*, etc. (*Signed by*) John Taylor.

FULWEILER, WALTER HERBERT, Wallingford, Pa., U.S.A. Chemical Engineer with The United Gas Improvement Co., Phila., Pa. B.S. in Chemistry, University of Pennsylvania, 1901. Chemist with Phila. Gas Works, 1901–1902. Chief chemist, The United Gas Improvement Co., 1913–1920. Chemical engineer, The United Gas Improvement Co., 1920–date. (*Signed by*) H. Jermain Creighton.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, June 1st, 1922, at 8 p.m., Professor T. M. LOWRY, C.B.E., F.R.S., Vice-President, in the Chair.

The CHAIRMAN referred to the loss sustained by the Society, through death, of:

	Elected.	Died.
George Robertson Hislop	Jan. 20th, 1870.	May 18th, 1922.

The following were formally admitted Fellows of the Chemical Society: A. D. Gay and E. A. Seeley.

Certificates were read for the first time in favour of:

Allin Cottrell, 3, Oxford Terrace, Edinburgh.
Reginald William Griffiths, B.Sc., 137, Holly Road, Handsworth, Birmingham.
John Watson Jenkin, B.Sc., A.I.C., Tregardock, St. Austell.
Ghulam Safdar Khan, B.Sc., Veterinary College, Lahore, India.
Hiroshi Nomura, Chemical Institute, Imperial University, Sendai, Japan.
Harold Pickles, The Gasworks, Kildwick, Keighley.
Stephen John Watson, B.Sc., 35, Oakfield Terrace, Gosforth, Newcastle-on-Tyne.
Alexander Mitchell Williams, M.A., D.Sc., Shirley Institute, Didsbury, Manchester.

The following papers were read:

"The reactivity of doubly-conjugated unsaturated ketones. Part III. Unsymmetrical hydroxy- and methoxy-derivatives." By J. S. BUCK and I. M. HEILBRON.

"Phenopyryllium salts of distyryl ketones. Part I." By J. S. BUCK and I. M. HEILBRON.

"Ring-chain tautomerism. Part II. The effect of the gem-diethyl group on the carbon tetrahedral angle." By S. S. DESHAPANDE and J. F. THORPE.

Ordinary Scientific Meeting, held in the Lecture Hall of the Institution of Mechanical Engineers, on Thursday, June 8th, 1922, at 8 p.m., Professor H. E. ARMSTRONG, LL.D., F.R.S., Vice-President, in the Chair.

Dr. H. H. Dale, C.B.E., F.R.S., delivered his Lecture entitled: "Chemical and Physiological Properties." A vote of thanks to the Lecturer, proposed from the Chair, and seconded by Mr. Francis H. Carr, was carried with acclamation, and acknowledged by Dr. Dale.

Ordinary Scientific Meeting, Thursday, June 15th, 1922, at 8 p.m., Sir JAMES WALKER, D.Sc., F.R.S., President, in the Chair.

Reference was made to the loss sustained by the Society, through death, of:

	Elected.	Died.
William Gowland	Feb. 2nd, 1871.	June 10th.
Thomas Henry Johnson	May 5th, 1921.	Feb. 19th.

The following were formally admitted Fellows of the Chemical Society: R. A. Fitzsimons, H. U. Harrow, E. M. James, and H. L. Riley.

Certificates were read for the first time in favour of:

William Leslie Carter, Ellesmere, Bloxcidge Street, Langley Green, Birmingham.
Wilfred Thomas Grey Davies, B.Sc., Plas y Coed, Derllwyn Road, Tondu, Bridgend.
Roy Gardner, B.Sc., Technical High School, Dunedin, New Zealand.
John Ernest Jewell, 34, Grove End Road, St. John's Wood, N.W. 8.
Charles William Moorhead, 23, Newbridge Road, Bath.
Albert Bramah Pearce Page, A.R.C.S., 27, Tanza Road, Hampstead, N.W. 3.
Arthur Scholefield, Poulton Hey, Bromborough, Birkenhead.
Stanley James Corrall Snedker, The Rowans, Wood Hey, Rock Ferry, Birkenhead.

Dr. H. M. Atkinson and Dr. P. C. Austin were elected Scrutators, and a ballot for the election of Fellows was held. The following were subsequently declared elected as Fellows:

George Baborovský, Ph.D.
Stanley John Bailey, B.A.
Harry Baines, B.Sc.
Frank Belton, B.Sc.
Victor Cecil Branson, B.Sc., A.R.C.S., A.I.C.
Robert Keith Cannan, M.Sc.
Bibhu Charan Chatterjee, M.Sc.
Robert Stanley Colborne, B.Sc., A.R.C.S.
James Brierley Firth, D.Sc., F.I.C.
Margaret White Fishenden, D.Sc.
Walter Herbert Fulweiler, B.S.
Frederick Walter Goddard, M.A.
Robert Swainson Hall.
Albert Hassell.

Edmund Langley Hirst, M.A., B.Sc., Ph.D.
Dorothea Annie Hoffert.
William Job Jenkins.
Peppo Joseph Levy.
David McCall, B.Sc.
Richard Edmund Antony Mallet, B.A.
Ronald George Wreyford Norrish, B.A.
John Goodrich Oats (Junr.).
Ralph Henry Parker.
Edith Annie Peach.
Claude Bernard Meister Platt, M.B.E.
Arthur Plowman, B.Sc., A.R.C.S., A.I.C.
John Pryde, B.Sc.
Juda Hirsch Quastel, B.Sc., A.R.C.S.
Edmond Samuels.
John Charles Smith, B.Sc.
Ronald William Stevenson, M.C., M.A.
Valerie Emeline Sophie Swainson, B.Sc.
Clifford Dane Thomas, B.Sc.
Nowroji Jamshedji Vazifdar.
George William Wigg.

The following papers were read:

"Ring-chain tautomerism. Part III. The occurrence of tautomerism of the three-carbon (glutaconic) type between a homocyclic compound and its unsaturated open-chain isomeride." By C. K. INGOLD, E. A. PERREN, and J. F. THORPE.

"The tautomerism of dyads. Part I. Experiments on the detection of tautomeric equilibria in hydrocyanic acid." By E. H. USHERWOOD.

LIST OF FELLOWS, 1922.

The List of Fellows for 1922 is being prepared, and changes of address received after July 31st, 1922, cannot be included therein. Fellows whose Christian names and degrees do not appear in full are particularly requested to notify the Assistant Secretary.

Owing to the heavy cost of printing, the List will be sent only to those Fellows who make application prior to August 31st, 1922.

THE LIBRARY.

The Library will be closed for Stocktaking from Monday, August 7th, until Saturday, August 19th, 1922, inclusive.

During the four weeks August 21st to September 16th the Library will close daily at 5 p.m.

List of Papers received between May 19th and June 15th, 1922:

"The interaction of sodium chloride and silica." By F. H. CLEWS and H. V. THOMPSON.

"Ring-chain tautomerism. Part II. The effect of the gem-diethyl group on the carbon tetrahedral angle." By S. S. DESHAPANDE and J. F. THORPE.

"Dyes derived from saccharine. The sulphim-phthaleins." By S. DATTA.

"Dyes derived from diphenyl-ketipic-dinitrile." By S. DATTA and N. K. SEN.

"Thermal expansion of gelatin gels." By A. TAFFEL.

"The rôle of protective colloids in catalysis. Part II." By T. IREDALE.

"The chlorinated dialkyl sulphides." By W. J. POPE and J. L. B. SMITH.

"Gallotannin. Part XIII. The identity of digallic acid from gallotannin with synthetic *m*-digallic acid." By M. NIERENSTEIN and C. W. SPIERS.

"Experiments on the synthesis of the polyacetic acids of methane. Part VI. Conditions of formation by the cyanoacetic ester method of unstable methanetriacetic esters and a new synthesis of methanetriacetic acid." By C. K. INGOLD and E. A. PERREN.

"Tables of average specific and atomic heat capacities of chemical elements in the order of the increment of the atomic weights and their interpretations. The law of Dulong and Petit." By P. N. TCHIRVINSKY.

"The dissociation pressures of hydrated double sulphates. Part I. Hydrated cupric alkali sulphates." By R. M. CAVEN and J. FERGUSON.

"The action of sodium sulphite on lead iodide." By G. SINGH.

"2 : 3 : 6-Trimethyl glucose." By J. C. IRVINE and E. S. STEELE.

"Researches on the constitution of coal." By S. R. ILLINGWORTH.

"The composition of paraffin wax. Part II." By F. FRANCIS, C. M. WATKINS, and R. W. WALLINGTON.

"Ring-chain tautomerism. Part III. The occurrence of tautomerism of the three-carbon (glutaconic) type between a homocyclic compound and its unsaturated isomeride." By C. K. INGOLD, E. A. PERREN, and J. F. THORPE.

"Note on the effect of a magnetic field on catalysis by ions in the presence of a para-magnetic salt." By W. E. GARNER and D. N. JACKMAN.

"Reciprocal induced polarity effects in cresols and their derivatives. Properties of the isomeric methoxybenzyl bromides." By A. LAPWORTH and J. B. SHOESMITH.

"Intermetallic actions. The system aluminium–arsenic." By Q. A. MANSURI.

"The tautomerism of dyads. Part I. Experiments in the detection of tautomeric equilibria in hydrocyanic acid." By E. H. USHERWOOD.

"The nitro-derivatives of metanitrodimethylaniline." By A. FORSTER and W. COULSON.

"Catalytic racemisation of optically active acid amides." By A. MCKENZIE and I. A. SMITH.

"The sorption of phosgene by beech wood charcoal." By H. M. BUNBURY.

"The adsorption of uranium-*X* and its isotope thorium by basic ferric acetate." By A. C. BROWN.

"The reactions of cellulose with sodium chloride and other neutral salt solutions. Part I. Preliminary survey." By H. MASTERS.

"The imino-aryl ethers. Part I. *N*-Phenylbenzimino-*m*-hydroxyphenyl ether and the synthesis of 2 : 4-dihydroxybenzophenone." By A. W. CHAPMAN.

"The intermolecular condensation of methylethyl ketone in the presence of carbide." By O. BECKER and J. F. THORPE.

"The equilibrium in systems composed of water and alcohols. The system methyl alcohol–water." By N. A. PUSHIN and A. A. GLAGOLEVA.

"The equilibrium in the system dinitrobenzene–urethane." By N. A. PUSHIN and A. FIOLETOVA.

"The chemistry of polycyclic structures in relation to their homocyclic unsaturated isomerides. Part III. Intra-annular tautomerism of α-campholytic acid." By J. P. C. CHANDRASENA, C. K. INGOLD, and J. F. THORPE.

"Adsorption and catalysis in Fuller's earth." By E. K. RIDEAL and W. THOMAS.

"The formation and stability of *spiro*-compounds. Part VIII. The Dieckmann-Komppa reaction." By F. DICKENS, G. A. R. KON, and J. F. THORPE.

"The cyanine dyes. Part V. The virtual tautomerism of the thio-cyanines." By W. H. MILLS and W. T. K. BRAUNHOLTZ.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

BERNTHSEN, AUGUST. A textbook of organic chemistry. New edition, revised to date. By JOHN JOSEPH SUDBOROUGH. London 1922. pp. xvi + 908. 12*s.* 6*d.* net. (*Recd.* 16/5/22.)

From the Publishers : Messrs. Blackie & Son.

BROOKS, BENJAMIN TALBOTT. The chemistry of the non-benzenoid hydrocarbons and their simple derivatives. New York 1922. pp. 612. ill. $7 net. (*Recd.* 11/5/22.)

From the Publishers : The Chemical Catalog Company, Inc.

DUCLAUX, JACQUES. Les colloïdes. 2nd edition. Paris 1922. pp. x + 306. 10 *fr.* (*Recd.* 13/6/22.)

From the Publishers: MM. Gauthier-Villars et Cie.

FALK, KAUFMAN GEORGE. Catalytic action. New York 1922. pp. 172. $2·50 net. (*Recd.* 8/6/22.)

From the Publishers: The Chemical Catalog Company, Inc.

FRIEND, JOHN NEWTON. The chemistry of combustion. London 1922. pp. viii + 110. ill. 4*s.* net. (*Recd.* 15/5/22.)

From the Publishers: Messrs. Gurney & Jackson.

HICKS, WILLIAM MITCHINSON. A treatise on the analysis of spectra: based on an essay to which the Adams prize was awarded in 1921. Cambridge 1922. pp. viii + 326. ill. 35*s.* net. (*Recd.* 11/5/22.) From the Syndics, Cambridge University Press.

IMPERIAL MINERAL RESOURCES BUREAU. Iron ore. (Summary of information as to the present and prospective iron-ore supplies of the world.) Part I. United Kingdom. London 1922. pp. 238. ill. 6*s.* net. (*Recd.* 7/6/22.)

—— The Mineral Industry of the British Empire and Foreign Countries. War Period. Coal, coke, and by-products (1913—1919). Part II. London 1922. pp. 160. ill. 6*s.* 6*d.* net. (*Recd.* 29/5/22.) From the Bureau.

KEMPTON, PERCIVAL HENRY SYDNEY. Industrial nitrogen: the principles and methods of nitrogen fixation and the industrial applications of nitrogen products in the manufacture of explosives, fertilizers, dyes, etc. London 1922. pp. xii + 104. ill. 2*s.* 6*d.* net. (*Recd.* 2/6/22.)

From the Publishers: Sir Isaac Pitman & Sons.

KNOX, JOSEPH. The fixation of atmospheric nitrogen. 2nd edition. London 1921. pp. viii + 124. ill. 4*s.* net. (*Recd.* 15/5/22.) From the Publishers: Messrs. Gurney & Jackson.

LAURIE, ARTHUR PILLANS. Building materials: an introduction to the study of the principal materials used in building construction. Edinburgh 1922. pp. viii + 188. ill. 6*s.* net. (*Recd.* 15/5/22.)

From the Publishers: Messrs. Oliver & Boyd.

PLIMMER, VIOLET G., and PLIMMER, ROBERT HENRY ADERS. Vitamins and the choice of food. London 1922. pp. xii + 164. ill. 7*s.* 6*d.* net. (*Recd.* 22/5/22.)

From the Publishers: Messrs. Longmans, Green & Co.

SHREVE, RANDOLPH NORRIS, WATSON, WARREN N., and WILLIS, A. R. Dyes classified by intermediates. Dyes tabularly arranged under each intermediate, with statistical and other data for both dyes and intermediates. Glossary of dye and intermediate names alphabetically arranged. New York 1922. pp. ii + 632. $10 net. (*Recd.* 31/5/22.)

From the Publishers: The Chemical Catalog Company, Inc.

STEWART, ALFRED WALTER. Some physico-chemical themes. London 1922. pp. xii + 420. ill. (*Reference.*) 21*s.* net.
From the Publishers : Messrs. Longmans, Green & Co.

II. *By Purchase.*

BUDOWSKI, I. Die Naphthensäuren. Berlin 1922. pp. vi + 116. ill. (*Recd.* 31/5/22.)

FODOR, ANDOR. Das Fermentproblem. Dresden 1922. pp. x + 280. ill. (*Recd.* 23/5/22.)

FUCHS, WALTER. Der gegenwärtige Stand des Gärungsproblems. (Sammlung, Vol. XXVII.) Stuttgart 1922. (*Reference.*)

GLAZEBROOK, SIR RICHARD. [Editor.] A dictionary of applied physics. Vol. I., etc. London 1922 +. ill. (*Reference.*)

GUILLET, LÉON, and PORTEVIN, ALBERT. An introduction to the study of metallography and macrography. Translated by LEONARD TARVENER. London 1922. pp. xvi + 290. ill. 30*s.* net. (*Recd.* 13/6/22.)

KEGHEL, MAURICE DE. Les encres, les cirages, les colles et leur préparation. Paris 1922. pp. 384. ill. (*Recd.* 10/6/22.)

LEWKOWITSCH, JULIUS. Chemical technology and analysis of oils, fats, and waxes. 6th edition, revised by GEORGE H. WARBURTON. Vol. II. London 1922. pp. xii + 960. ill. 42*s.* net. (*Recd.* 25/5/22.)

MANN, JOHN DIXON. Forensic medicine and toxicology. 6th edition. Revised by WILLIAM A. BREND. London 1922. pp. xii + 574. ill. 30*s.* net. (*Recd.* 13/6/22.)

PROCTER, HENRY RICHARDSON. The principles of leather manufacture. 2nd edition. London 1922. pp. viii + 688. ill. 32*s.* net. (*Recd.* 13/6/22.)

REVUE DE METALLURGIE. Fondée avec concours de la Société d'Encouragement pour l'Industrie Nationale, du Comité des Forges de France et de différents établissements industriels. Vol. 16, etc. Paris 1919 +. (*Reference.*)

TUTTON, ALFRED EDWIN HOWARD. Crystallography and practical crystal measurement. 2 vols. [2nd edition.] London 1922. pp. xviii + 746 + xiv, viii + 747 to 1446. ill. £5 net. (*Recd.* 13/6/22.)

VALENTA, EDUARD. Photographische Chemie und Chemikalienkunde mit Berücksichtigung der Bedürfnisse der graphischen Druckgewerbe. Part I. Anorganische Chemie. 2nd edition. Halle (Saale) 1921. pp. xvi + 282. ill. (*Recd.* 31/5/22.)

ZERR, GEORG, and RÜBENCAMP, ROB. Handbuch der Farbenfabrikation. 3rd edition. Berlin 1922. pp. xvi + 908. ill. (*Recd.* 23/5/22.)

III. *Pamphlets.*

BAILEY, E. H. S. A dietary study of some Kansas institutions under the control of the State Board of Health. Lawrence, Kansas 1921. pp. 70.

BRITISH COTTON INDUSTRY RESEARCH ASSOCIATION. The Shirley Institute. [Didsbury] 1922. pp. 22. ill.

CANADIAN INSTITUTE OF CHEMISTRY. [History, etc.] Montreal [1922]. pp. 56. ill.

INSTITUTE OF CHEMISTRY OF GREAT BRITAIN AND IRELAND. Lecture on chemists and the patent laws. By HORATIO BALLANTYNE. London 1922. pp. 31.

MOIR, JAMES. Colour and chemical constitution. Part XIII. The calculation of the colour of the monocyclic dyes. Part XIV. The calculation of the colour of the dicyclic dyes. (From the *Trans. Roy. Soc. S. Africa*, 1921, **10**.)

SCIENTIFIC AND INDUSTRIAL RESEARCH, Department of. Bulletin No. 6. On the electro-deposition of iron. With an appendix containing a bibliography on the subject. By WILLIAM EARL HUGHES. London 1922. pp. iv + 50. ill.

—— Deterioration of structures of timber, metal, and concrete exposed to the action of sea-water. Second (interim) report of the Committee of the Institution of Civil Engineers. Edited by P. M. CROSTHWAITE and GILBERT R. REDGRAVE. London 1922. pp. 57.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, October 5th, 1922, at 8 p.m., Sir JAMES WALKER, D.Sc., F.R.S., President, in the Chair.

Reference was made to the loss sustained by the Society, through death, of the following Fellows:

	Elected.	Died.
Frederick Bedford	June 20th, 1901.	July 13th.
Frederick Douglas Brown	Mar. 20th, 1876.	Aug. 2nd.
William Kellner	Mar. 19th, 1874.	Sep. 12th.
George William MacDonald ...	Dec. 6th, 1894.	Aug. 7th.
Alfred Ernest Moore	June 17th, 1903.	Mar. 1st.
Arthur Faraday Price	May 4th, 1882.	Mar. 17th.
Alexander Smith	April 17th, 1890.	Sep. 8th.
Lionel William Stansell	Feb. 3rd, 1887.	May 22nd.
James Stenhouse	May 5th, 1892.	Mar. 18th.
Matthew Carrington Sykes	Feb. 19th, 1891.	Aug. 25th.
Jokichi Takaminé	Feb. 3rd, 1887.	July 22nd.
Stanley Goulden Thompson ...	May 1st, 1919.	Feb. 23rd.
James Waterhouse	Feb. 7th, 1901.	Sep. 28th.

In announcing the resignation of Dr. M. O. Forster from the office of Treasurer, the President referred to the many valuable services Dr. Forster had rendered to the Society during the past twenty years. His resignation was received with profound regret and his presence at the meetings would be greatly missed, and the President wished him, in the name of the Society, every success in the important work he was about to undertake as Director of the Institute of Science at Bangalore. Dr. Forster briefly responded.

It was stated that the Council had nominated Professor J. F. Thorpe, C.B.E., F.R.S., to fill the office of Treasurer until the date of the next Annual General Meeting, and that Dr. J. T. Hewitt, F.R.S., had been nominated to fill, for the same period, the vacancy amongst the Vice-Presidents caused by Professor Thorpe's appointment.

The President further announced that some time ago the American Chemical Society submitted to the Council certain proposals according to which we should be associated with them in the future conduct and control of the *Journal of Physical Chemistry*. Advantage was taken of the recent presence in this country of Dr. Parsons, Secretary of the American Chemical Society, to carry through the negotiations. The Council has to report that a satisfactory issue has been reached, the scheme having been widened to admit of the association of the Faraday Society with the enterprise. From some future date, probably January 1924, the *Journal of Physical Chemistry* will be accordingly issued under the auspices of the American Chemical Society, the Chemical Society, and the Faraday Society. The editorial board will consist of four American and four British representatives, together with an Editor-in-Chief appointed by these eight.

The following were formally admitted Fellows of the Chemical Society: J. P. Levy, F. M. Brewer, V. E. S. Swainson, and R. S. Colborne.

Certificates were read for the first time in favour of:

Robert Allanson, 10, Grosvenor Drive, New Brighton, Wallasey.
Thomas Cuthbert Allchin, M.B.E., E. C. Powder Co., Ltd., Longfield, Kent.
James Wilson Armit, M.A., The Manse, Monikie, Dundee.
Menghraj Choithram Bathija, B.A., Fitzwilliam Hall, Cambridge.
Donald Charles Broome, Disgwylfa, Penmaenmawr, Carnarvonshire.
Walter Ferguson Buist, B.Sc., 24, New Hall Lane, Clubmoor, Liverpool.
Stanley Robert Bult, 63, Addiscombe Road, Croydon.
Arthur Josiah Burford, 419, Edgware Road, Maida Vale, W. 2.
Katragadda Seshachalam Choudary, M.A., M.Sc., 71, Coral Merchant Street, George Town, Madras, India.
Elliott Martin Christie, M.Sc., 37, Lynwood Avenue, Dunedin, New Zealand.
Frederick Stanley Clarke, 64, Golders Manor Drive, N.W. 11.
Sydney George Cavigan, 22, Walker Street, Burton-on-Trent.
Edward Dance, B.Sc., Castle Inn, Sandal, Wakefield.
Milton Dewhurst, B.Sc., A.I.C., 1280, Warwick Road, Acocks Green, Birmingham.
Samuel Frederick Ford, 65, Abbotts Road, Southall.
John Masson Gulland, B.Sc., 11, Chester Street, Edinburgh.
Herbert Haigh, B.Sc., 211, Park Road, Barnsley.
Thomas Edward Hubbard, 9, Cunliffe Street, Pendleton, Manchester.
James Ernest Humphries, B.A., M.Sc., 29, St. John's Road, Newport, Mon.
John Huntley, The Villa, Burstwick, nr. Hull.
Sydney Alfred Hurren, M.C., 39, Upper Marylebone Street, W. 1.
Habib Iskander, Heliopolis, Cairo, Egypt.
Edgar Jones, 167, Upper Dale Road, Derby.
Jan Kalff, D.Chem., Nieuwe Prinsengracht 126, Amsterdam.
Shankar Nath Kapur, B.Sc., 11, George Square, Edinburgh.
William Dawson Lloyd, 42, Tavistock Road, Westbourne Park, W. 11.
Philip Patrick Lynch, B.Sc., Church Street, Timaru, New Zealand.

Francis Geoffrey Macalpine, B.Sc., Broad Oak, Accrington.
Frederick Henry McDowall, M.Sc., Knox College, Dunedin, New Zealand.
Kenneth McKenzie, Endrik, Hamilton Road, Cambuslang, Glasgow.
Archibald Roy Hammond Martin, B.A., 8, Kingsland Road, Worthing.
Dina Nath, c/o P. Lal, Esq., Vakil, Jullundhur City, Punjab, India.
Torkild Haastrup Nielsen, B.Sc., Siam Cement Co., Ltd., Bangsūe, Siam.
Hidejiro Nishikawa, 3, Hachimancho, Asakusa, Tokyo, Japan.
Joseph Edwards Pooley, 1, Margaretting Road, Manor Park, E. 12.
Nagendra Prasad, M.Sc., Ranchi, Behar & Orissa, India.
Edmund Brydges Rudhall Prideaux, M.A., D.Sc., F.I.C., 6, Arboretum Street, Nottingham.
James Robert Pound, M.Sc., 601*a*, Dana Street, Ballarat, Victoria, Australia.
Alfred Norman Douglas Pullen, The Larches, Greenham Common, Newbury.
Thomas Abraham Robertson, Sassafras, Rickard Road, Bankstown, N.S.W.
Burke Rushworth, 4, West Park Terrace, Healey, Batley, Yorks.
Gopal Singh, M.Sc., The Brij, Gawalmaudi, Lahore, India.
George Victor Smith, A.R.C.S., Westleigh, Eggington Road, Wollaston, Wellingborough.
Francis Wilbert Stoyle, M.Sc., 37, Kansas Avenue, Belfast.
Leslie Stuart Theobald, A.R.C.S., 3, Ennismore Avenue, Chiswick, W. 4.
William Thompson, B.Sc., Ravensworth, Cockton Hill, Bishop Auckland.
Laurence Barnett Timmis, M.Sc.Tech., A.I.C., 19, Trinity Marsh Lane, Waltham Cross.
Richard Truszkowski, B.Sc., Koszykowa 21, m-3, Warsaw, Poland.
Humphrey Terence Viney, B.Sc., Bramerton, Blakebrook, Kidderminster.
Eric Richard Boraman Woodward, B.Sc., The Vicarage, Herne Bay, Kent.
William James Uglow Woolcock, C.B.E., M.P., 166, Piccadilly, W. 1.

The following papers were read :

"Cupric tetrammine nitrite and the corrosion of copper by aqueous solutions of ammonia and of ammonium nitrate." By H. Bassett and R. G. Durrant.

"The additive formation of four-membered rings. Part I. The synthesis and resolution of some derivatives of 1 : 3-diazidine." By C. K. Ingold and H. A. Piggott.

"Rates of reduction of nitro-groups by hydrogen in the presence of colloidal palladium, especially of nitrotoluene isomerides." By W. H. Patterson.

"A determination of the relative proportions of the isomerides in nitrotoluene or toluidine." By W. H. Patterson.

Ordinary Scientific Meeting, Thursday, October 19th, 1922, at 8 p.m. Professor H. E. Armstrong, LL.D., F.R.S., Vice-President, in the Chair.

Reference was made to the loss sustained by the Society, through death, of :

	Elected.	Died.
Frederick Thomas Harry	June 20th, 1908.	Sept. 14th, 1922.
Edmond Herbert Grove-Hills	Feb. 15th, 1894.	Oct. 2nd, 1922.

Mr. C. D. Thomas was formally admitted a Fellow of the Chemical Society.

Certificates were read for the first time in favour of:

Leslie Bains, B.A., B.Sc., A.I.C., 5, Carlton Road, Stroud Green, N. 4.
George Joseph Burrows, B.Sc., Chemical Department, The University, Sydney, N.S.W.
John Hardwick Long Champion, B.Sc., 41, Triangle West, Clifton, Bristol.
Norman Evers, B.Sc., F.I.C., The Cottage, Salisbury Avenue, Cheam, Sutton.
Joshua William Farmery, M.A., A.I.C., 56, Sheen Road, Richmond, Surrey.
Philip Henry Gifford, B.Sc., Boys' High School, Salisbury, Rhodesia.
Joseph Keith Matthews, M.A., Cedric House, Rainhill, Liverpool.
John Ewart Moss, M.Sc., 298, Franklin Road, Kings Norton, Birmingham.
Harry Ward, M.Sc., A.I.C., 28, Commercial Street, E. 1.

The following papers were read:

"The polarity of double bonds. An extension of the theories of Lapworth and Robinson." By T. M. LOWRY.

"The theories of polarity in organic compounds." By J. KENNER.

"A model to illustrate the orbits of the electrons above the carbon atom." By W. E. GARNER.

NOTICES.

The next Ordinary Scientific Meeting takes place on November 2nd, at 8 p.m., and an Informal Meeting will be held on November 16th, after the conclusion of the formal business of the Ordinary Scientific Meeting at 8 p.m.

RESEARCH FUND.

A meeting of the Research Fund Committee will be held in December next. Application for Grants, to be made on forms obtainable from the Assistant Secretary, Chemical Society, Burlington House, W. 1, must be received on or before Friday, December 1st, 1922.

All persons who received Grants in December, 1921, or December of any previous year, whose accounts have not been closed by the Council, are reminded that reports must be returned by December 1st.

COLLECTIVE INDEX, VOL. VI (1913–1922).

Volume VI of the Collective Index will be published in two parts. Part I (Index to Authors) will be issued in 1923 and Part II (Index to Subjects) in 1924.

The price to Fellows who apply before *Christmas Day*, 1922, is £2 17*s*. post free. A remittance, made payable to Mr. S. E. Carr, must accompany the application in each case and should be sent to the Assistant Secretary, Chemical Society, Burlington House, W. 1. The price to Fellows who apply after December 25th, 1922, will be £3 7*s*.

Arrangements have been made by which cases in blue or maroon cloth for binding this Index in three volumes (Authors Index 1 vol. and Subject Index, 2 vols.) will be supplied for the sum of Seven Shillings. The binding will involve an additional charge of 2*s*. 3*d*. per volume. The total cost, therefore, of binding the Index in cloth will be 13*s*. 9*d*.

Fellows desiring to avail themselves of this offer should apply to Messrs. Gurney & Jackson, 33, Paternoster Row, London, E.C. 4, and also inform the Assistant Secretary, so that the necessary instructions may be given for the Index to be posted direct to the Publishers.

RUSSIAN FUND.

A further appeal has been issued on behalf of Russian Men of Science. In addition to donations of money to be devoted to purchasing requisite articles, gifts of clothing (which, if used, must be in good condition) and recent chemical literature will be welcome.

The Chemical Society will act as the receiving depôt, and cheques (made payable to Mr. S. E. Carr and crossed "Russian Fund"), together with parcels of clothing, boots, books, etc., should be addressed to the Assistant Secretary, Chemical Society, Burlington House, W. 1.

List of Papers received between June 16th and October 19th, 1922:

"Experiments on the synthesis of the polyacetic acids of methane. Part VII. The preparation of methylidenetriacetic acid and of methanetetra-acetic acid." By C. K. Ingold and L. C. Nickolls.

"An instance illustrating the effect of attached groups on the ease of formation of the *cyclo*pentanone ring." By J. P. C. Chandrasena and C. K. Ingold.

"The formation and stability of *spiro-compounds*. Part IX. The influence on stability of groups of high molecular weight." By S. F. Birch and J. F. Thorpe.

"The viscosity of cellulose. Part II. The lowering of the viscosity of cellulose by various reagents." By R. A. JOYNER.

"The constitution of polysaccharides. Part V. The yield of glucose from cotton cellulose." By J. C. IRVINE and E. L. HIRST.

"The action of solvents on coal. Part I." By S. R. ILLINGWORTH.

"Studies in the glucosides. Part I. The constitution of indican." By A. K. MACBETH and J. PRYDE.

"The alkylhydrazones." By O. L. BRADY and G. P. MCHUGH.

"The formation of bromine derivatives of carbon without the production of hydrogen bromide." By B. M. GUPTA and J. F. THORPE.

"Limits for the propagation of flame at various temperatures in mixtures of ammonia with air and oxygen." By A. G. WHITE.

"The molecular scattering of light in normal pentane." By R. VENKATESWARAN.

"Preparation and reactions of stannous oxide and stannous hydroxides." By F. W. BURY and J. R. PARTINGTON.

"Investigation of antimony metal from different sources. Indication of isotopes." By S. D. MUZAFFAR.

"The catalytic decomposition of formic acid on surfaces of platinum and silver." By H. C. TINGEY and C. N. HINSHELWOOD.

"Inorganic complex salts. Crystallographic and optical study. Part I." By I. E. KNAGGS.

"The formation of derivatives of tetrahydronaphthalene from γ-phenyl fatty acids. Part II." By A. STEVENSON and J. F. THORPE.

"*N*-Oximino-ethers. Part II. *N*-Aryl ethers of 2 : 4- and 2 : 6-dinitrobenzaldoxime." By F. BARROW, E. D. GRIFFITHS, and E. BLOOM.

"The nitro- and amino-derivatives of *o*- and *p*-methoxybenzoic acid and of α- and β-methoxynaphthoic acid." By V. FROELICHER and J. B. COHEN.

"The addition of ethyl sodiocyanoacetate and ethyl sodiomalonate to ethyl muconate." By E. H. FARMER.

"A synthesis of pyrylium salts of anthocyanidin type." By D. D. PRATT and R. ROBINSON.

"The action of sodium methoxide and its homologues on benzophenone chloride and benzylidene chloride. Part III." By J. E. MACKENZIE.

"On diacetylacetone." By J. N. COLLIE and A. A. B. REILLY.

"The explosion of acetylene and nitrogen. Part II." By W. E. GARNER and K. MATSUNO.

"The applicability of a linear poisoning law to the catalytic decomposition of hydrogen peroxide." By E. B. MAXTED.

"Molecular weights in alcoholic solutions from the elevation of the flash point." By R. WRIGHT.

"Selective solubility shown by aqueous alcohol when acting as a solvent." By R. WRIGHT.

"Attempts to prepare red sulphide dyes. Part II. Mercaptan derivatives of azo-dyes." By E. R. WATSON and S. DUTT.

"The isolation of muscarine, the potent principle of *Amanita muscaria*." By H. KING.

"Researches on residual affinity and co-ordination. Part IX. Cobaltammine salts of the nitro-dyes." By G. T. MORGAN and H. J. S. KING.

"The mobility of symmetrical triad systems. Part I. The conditions which confer mobility on symmetrical open-chain systems terminated by phenyl groups." By C. K. INGOLD and H. A. PIGGOTT.

"Cevadine. Part I." By A. K. MACBETH and R. ROBINSON.

"Cyclic addition. Part I. The occurrence and reversibility of reactions in which cyclic structures are formed by the direct union of unsaturated linkages. Part II. The reaction between azomethines." By C. K. INGOLD and H. A. PIGGOTT.

"*iso*Propylstannonic acid and some of its derivatives." By J. G. F. DRUCE.

"Syntheses of alkylidenecyanoacetic acids and of substituted succinic acids. Part I. Acids containing aromatic residues." By A. LAPWORTH and J. A. MCRAE.

"On crystalline glucose-ammonia and *iso*glucosamine." By A. R. LING and D. R. NANJI.

"The autoreduction of sulphurous acid." By G. M. BENNETT.

"Researches on the conditions of formation of rings attached to the *o*-, *m*-, and *p*-positions of the benzene nucleus. Part I. The action of sodium on *o*-phenylenediacetic ester." By W. H. PERKIN and A. F. TITLEY.

"A method for the preparation of αββ-trialkylated glutaric acids." By G. A. R. KON and J. F. THORPE.

"The bromine compounds of phenanthrene. Part II." By H. HENSTOCK.

"The solubility of phenanthrene in various organic solvents." By H. HENSTOCK.

"The sorption of liquids by charcoal." By J. DRIVER and J. B. FIRTH.

"The equilibria in aqueous solutions of the alkali metal bisulphites." By E. C. C. BALY and R. A. BAILEY.

"Studies in the anthracene series. Part III." By E. DE B. BARNETT, J. W. COOK, and H. H. GRAINGER.

"The solubilities of the alkaline formates and acetates in water." By N. V. SIDGWICK and J. A. H. R. GENTLE.

"The solubility of the alkaline salts of benzoic and the hydroxybenzoic acids in water." By N. V. SIDGWICK and E. K. EWBANK.

"The mechanism of the formation of benzoylbenzoin by treatment of benzoylmandelonitrile with an alcoholic solution of sodium ethoxide." By H. GREENE and R. ROBINSON.

"The oxime of mesoxamide (*iso*nitrosomalonamide) and some allied compounds. Part IV. The ethers of *iso*nitrosomalonanilide, and *iso*nitrosomalondimethylamide, and *iso*nitrosomalondibenzylamide." By A. G. RENDALL and M. A. WHITELEY.

"Researches on residual affinity and co-ordination. Part X. Salicylatotetramminocobaltic salts and the constitution of oxonium compounds." By G. T. MORGAN and J. D. MAIN SMITH.

"The cyanine dyes. Part VI. Dyes containing a quinoline and a benzothiazole nucleus. The thio*iso*cyanines." By W. T. K. BRAUNHOLTZ and W. H. MILLS.

"The isomerism of the oximes. Part X. Cinnam- and nitrocinnam-aldoximes." By O. L. BRADY and C. D. THOMAS.

"The problem of substitution in the benzene nucleus and the Thomson-Lewis-Langmuir theory of co-valence." By R. FRASER and J. E. HUMPHRIES.

"The constitution of soap solutions. Cetylsulphonic acid and other sulphonates." By M. H. NORRIS.

"Physical chemistry of the oxides of lead. Part VI. The anodic behaviour of lead and lead peroxide." By S. GLASSTONE.

"Use of paraformaldehyde (gaseous formaldehyde) and paraldehyde (gaseous acetaldehyde) in the synthesis of alcohols." By C. E. WOOD and F. SCARF.

"Rotatory dispersion of the esters of lactic acid. Normal esters. Part I." By C. E. WOOD, J. E. SUCH, and F. SCARF.

"The solubility and volatility of 1 : 3 : 5-dinitrophenol." By N. V. SIDGWICK and T. W. J. TAYLOR.

"The labile nature of the halogen atom in organic compounds. Part V. The action of hydrazine on the halogen derivatives of some esters and *cyclo*hexanes." By E. L. HIRST and A. K. MACBETH.

"Esters of the hydroxyalkylarylamines. Part I. Acid sulphuric esters of the simple monohydroxyethylarylamines." By K. H. SAUNDERS.

"Harmine and harmaline. Part VI. The synthesis of *n*-methyltetrahydroharmine and the constitution of harmaline and of the alkylated harmines." By W. O. KERMACK, W. H. PERKIN, and R. ROBINSON.

"Note on the decomposition of the dithiocarbazinates." By S. M. LOSANITCH.

"The interaction of aldehydes and ketones with thiocarbamides in the presence of acids. Part II." By J. TAYLOR.

"The preparation of methylguanidine, and of ββ-dimethylguanidine by the interaction of dicyanodiamide, and methylammonium and dimethylammonium chlorides respectively." By E. A. WERNER and J. BELL.

"Adsorption and catalysis in Fuller's earth." By E. K. RIDEAL and W. THOMAS.

"Quantitative reduction by hydriodic acid of halogenated malonyl derivatives. Part II. The *s*.-tetra-substituted amides of bromo- and chloro-malonic acid." By R. W. WEST.

"Amylases of the cereal grains—the 'insoluble' amylase of barley." By J. L. BAKER and H. F. E. HULTON.

"Reactivity of hydrogen atoms in methylene groups." By T. H. READE.

"The condensation of the aromatic *o*-amino-sulphonic acids with *iso*cyanic acid." By J. R. SCOTT and J. B. COHEN.

"Monothioethylene glycol." By G. M. BENNETT.

"The β-chlorovinylarsines." By F. G. MANN and W. J. POPE.

"Piperitone. Part IV. The interaction of *dl*-piperitone and semicarbazide, and the isolation of pure *dl*-piperitone." By J. READ and H. G. SMITH.

"The chlorination and bromination of the toluic acids and the preparation of the phthalaldehydic acids." By W. DAVIES and W. H. PERKIN.

"The isomerism of metallic oxides. Part I. Lead monoxide." By M. P. APPLEBEY and R. D. REID.

"The action of the chlorides of phosphorous on chlorodimethyldihydroresorcin." By L. E. HINKEL and W. D. WILLIAMS.

"On the movements of explosion waves in tubes of different shapes." By C. CAMPBELL.

"The chlorination of benzoyl chloride." By E. HOPE and G. C. RILEY.

"Ethyl α-cyano-β-methyl glutaconate and its methyl homologues." By E. HOPE.

"The addition of hydrogen cyanide to derivatives of glutaconic acid. Part I. The addition of hydrogen cyanide to ethyl-α-

cyano-β-methyl glutaconate and its homologues." By E. Hope and W. Sheldon.

"The velocity of reaction in mixed solvents. Part III. The influence of temperature on the velocity of saponification of esters." By H. McCombie, H. A. Scarborough, and R. H. Settle.

"The action of ferrous chloride on some organic hydrochlorides." By W. M. Cumming.

"The form of the vapour-pressure curve at high temperature. Part I. The curve for lead." By C. K. Ingold.

"The optical rotations of the sugars." By J. G. Maltby.

"Heteromorphism of calcium sulphate. Alabaster and its synthesis." By M. Copisarow.

"Heteromorphism of calcium carbonate. Marble: synthetic and metamorphic." By M. Copisarow.

"Researches on residual affinity and co-ordination. Part IX. Interaction of selenium tetrachloride and β-diketones." By G. T. Morgan, H. D. K. Drew, and T. V. Barker.

"The ignition of gases. Part II. Ignition by a heated surface. Mixtures of methane and air." By W. Mason and R. V. Wheeler.

"On the interchange of alcohol radicles in esters. Part II." By A. Shimomura and J. B. Cohen.

"Note on the reduction of thorium oxide by metallic tungsten." The Research Staff of the General Electric Co., Ltd., London (C. J. Smithells).

"γ-Methylfructoside." By R. C. Menzies.

"The ultrafiltration of soap solutions: sodium oleate and potassium laurate." By J. W. McBain and W. J. Jenkins.

"Some new derivatives of methylstannonic acid; their bearing upon its constitution." By H. Lambourne.

"Note on the hydrolysis of ββ′-dichloroethyl sulphide. Part I. Synthesis of divinyl sulphide and the preparation of a non-vesicant isomer of ββ′-dichloroethyl sulphide." By S. H. Bales and S. A. Nickelson.

"The quaternary salts of quinaldinic acid." By W. H. Mills and F. M. Hamer.

"A modified methyl-orange indicator." By K. C. D. Hickman and R. P. Linstead.

"The labile nature of the halogen atom in organic compounds. Part VI. The action of titanous chloride and of ammonia on representative halogen compounds." By I. A. Black, E. L. Hirst, and A. K. Macbeth.

"The interaction of aniline and acrolein." By F. G. Mann.

"*p*-Dithiobenzoic acid." By S. Smiles and D. C. Harrison.

"The reversibility of the reaction between nitrogen, carbon, and sodium carbonate." By C. K. INGOLD and D. WILSON.

"Limits for the propagation of flame in vapour–air mixtures. Part II. Mixtures of more than one vapour and air at the ordinary temperature and pressure." By A. G. WHITE.

"The constitution of carbamides. Part XIV. The decomposition of urea by sodium hypobromite in alkaline solution, and an improved procedure for the estimation of urea by this means." By E. A. WERNER.

"The system chromium trioxide–sulphur trioxide–water." By L. F. GILBERT, H. BUCKLEY, and I. MASSON.

"The constitution of acetone derivatives of glucose and fructose." By J. C. IRVINE and J. PATTERSON.

"The formation and properties of dithio-ketones ($R_2C{:}S{:}S$) and dithio-ether ($R_2S{:}S$). Part III." By K. G. NAIK and M. D. AVASARE.

"The constitution of the terpene present in the essential oil from *Andropogon Jwarancusa*, Jones." By J. L. SIMONSEN.

"The action of bromine water on indene." By J. READ and E. HURST.

"Note on the dilution of ethylenebromohydrin with water." By J. READ and G. J. BURROWS.

"The solubilities of the aldehydo-benzoic acids." By N. V. SIDGWICK and H. CLAYTON.

"The solubility of the chlorophenols." By N. V. SIDGWICK and S. L. TURNER.

"The resolution of tropic acid and the stereochemical configuration of the cinchona alkaloids." By H. KING and A. D. PARKER.

"The methylation of xylose." By E. L. HIRST and A. CARRUTHERS.

"The specific heats of gases with special reference to hydrogen." By C. K. INGOLD and E. H. USHERWOOD.

"Purification of methyl alcohol by means of sodium hypochlorite." By R. C. MENZIES.

"Cupric tetrammine nitrite and the corrosion of copper by aqueous solutions of ammonia and of ammonium nitrate." By H. BASSETT and R. G. DURRANT.

"The speed of the uniform movement of flame in mixtures of the paraffins with air." By W. MASON.

"Mutarotation and pseudo-mutarotation in the glucosamine series." By J. C. IRVINE and J. C. EARL.

"Salicylidene derivatives of *d*-glucosamine." By J. C. IRVINE and J. C. EARL.

"Perhalides of the phenyltrimethylammonium series." By H. MCCOMBIE and T. H. READE.

"Note on the preparation of the sodium and potassium derivatives of phthalimide." By D. L. HAMMICK and G. H. LOCKET.

"The additive formation of four-membered rings. Part I. The synthesis and resolution of some derivatives of tetrahydro-1 : 3-diazine." By C. K. INGOLD and H. A. PIGGOTT.

"Derivatives of dithiophenyl-benzene." By S. SMILES and H. GRAHAM.

"The products of fermentation of cellulose." By H. LANGWELL.

"The labile nature of the halogen atom in organic compounds. Part VII. The absorption spectra of the halogen derivatives of some cyclic compounds and their bearing on the question of an oxygen–halogen linking." By H. GRAHAM and A. K. MACBETH.

"The polarity of double bonds. An extension of the theories of Lapworth and Robinson." By T. M. LOWRY.

"2 : 4-Dinitrobenzil." By G. B. BISHOP and O. L. BRADY.

"Rates of reduction of nitro-groups by hydrogen in the presence of colloidal palladium, especially of nitrotoluene isomerides." By W. H. PATTERSON.

"A determination of the relative proportions of the isomerides in nitrotoluene or toluidine." By W. H. PATTERSON.

"The synthesis of *m*-α-benzbispyrrole derivatives." By W. DAVIES and E. H. C. HICKOX.

"Viscosity of organic liquid mixtures and its relationship to chemical composition and vapour pressure and certain other physical properties." By M. A. SOOFI.

"The system tin–arsenic." By Q. A. MANSURI.

"On the preparation of glucinum sulphate and the system: ammonium sulphate–glucinum sulphate–water at 25° C." By H. T. S. BRITTON.

"Aromatic sulphonic chlorides." By J. STEWART.

"The oleo-resin of *Canarium muelieri*." By T. G. H. JONES and F. SMITH.

"The conditions underlying the formation of unsaturated and cyclic compounds from halogenated open-chain derivatives. Part V. Products derived from α-halogenated β-methylglutaric acid." By C. K. INGOLD.

"The behaviour of the stannic acids towards solutions of alkaline hydroxides." By G. E. COLLINS and J. K. WOOD.

"A specific cellulose-fermenting organism." By H. LANGWELL.

"The mechanism of the bromination of phenol in aqueous solution." By H. BAINES.

"The theories of polarity in organic compounds." By J. KENNER.

"The solubility and volatility of the nitrobenzaldehydes." By N. V. SIDGWICK and W. M. DASH.

"The action of magnesium on symmetrical tetrachloro- and tetrabromo-tetramethylmethane." By A. FAIRBOURNE.

"The triazo-group. Part XXII. Cinnamic acid chlorohydrin and its conversion into α-triazo-β-hydroxy-β-phenylpropionic acid." By M. O. FORSTER and W. B. SAVILLE.

"A model to illustrate the orbits of the electrons about a carbon atom." By W. E. GARNER.

"The labile nature of the halogen atom in organic compounds. Part VIII. The reduction of chloro- and bromo-trinitromethane and of tetranitromethane." By T. HENDERSON and A. K. MACBETH.

"The condensation of 9 : 10-diaminophenanthrene with phenanthraquinone and other *o*-quinones." By S. DUTT and E. R. WATSON.

"Studies in the β-phenylglutaric acid series. Part I. A possible basis of a new method for the determination of the relative distribution of the valencies of polyvalent elements." By J. G. JACKSON and J. KENNER.

"A simplified method for the resolution into its optically active components of *sec.*-octyl alcohol (methyl-*n*-hexylcarbinol)." By J. KENYON.

"Electro-synthesis of azelaic and thapsic acids." By M. CARMICHAEL.

"Photocatalysis. Part III. The photosynthesis of naturally occurring nitrogen compounds from carbon dioxide and ammonia." By E. C. C. BALY, I. M. HEILBRON, and H. J. STERN.

"The preparation of potassium and sodium arylsulphoniodoamides." By E. ROBERTS.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

BARKER, THOMAS VIPOND. Graphic and tabular methods in crystallography as the foundation of a new system of practice: with a multiple tangent table and a 5-figure table of natural cotangents. London [1922]. pp. xvi+152. ill. 14*s.* net. (*Recd.* 3/10/22.) From the Author.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. A retrospect 1831—1921. By O. J. R. HOWARTH. London 1922. pp. viii+318. ill. (*Reference.*) From the British Association.

British Association for the Advancement of Science. Fourth report on colloid chemistry and its general and industrial applications. London 1922. pp. 382. 5*s*. 6*d*. net. (*Recd.* 15/9/22.)

From the Dept. of Scientific and Industrial Research.

Cain, John Cannell. The manufacture of dyes. London 1922. pp. x+274. 12*s*. 6*d*. net. (*Recd.* 3/10/22.)

From Mrs. J. C. Cain.

Denham, Henry George. An inorganic chemistry. London 1922. pp. viii+684. ill. 12*s*. 6*d*. net. (*Recd.* 5/7/22.)

From the Author.

Foote, Paul D., and Mohler, F. L. The origin of spectra. New York 1922. pp. 250. ill. $4.50. (*Recd.* 30/9/22.)

From the Publishers: The Chemical Catalog Company, Inc.

[Fritz, John.] The John Fritz Medal. [2nd edition. New York 1922.] pp. 128. ill. (*Recd.* 23/6/22.)

From the Board of Award.

Griffiths, Hugh. Materials of chemical plant construction—non-metals. London 1922. pp. 64. ill. 3*s*. net. (*Recd.* 4/9/22.)

——. The general principles of chemical engineering design. London 1922. pp. 64. ill. 3*s*. net. (*Recd.* 4/9/22.)

From the Publishers: Messrs. Benn Brothers.

Hale, Arthur James. Modern chemistry, pure and applied. Vol. V. London [1922]. pp. viii+280. ill. 16*s*. net. (*Recd.* 7/9/22.) From the Publishers: Messrs. Virtue & Co.

Henrich, Ferdinand. Theories of organic chemistry. Translated from the revised 4th German edition of 1921 by Treat Baldwin Johnson and Dorothy A. Hahn. New York 1922. pp. xvi+604. ill. 30*s*. net. (*Recd.* 9/10/22.)

From the London Publishers: Messrs. Chapman & Hall.

Holmes, Harry N. Laboratory manual of colloid chemistry. New York 1922. pp. xii+128. 10*s*. net. (*Recd.* 21/8/22.)

From the London Publishers: Messrs. Chapman & Hall.

Imperial Institute. Indian Trade Enquiry. Drugs and tanning materials. Reports on cinchona bark and myrobalans. London 1922. pp. x+60. 4*s*. net. (*Recd.* 28/7/22.)

From the Director.

International Brewers' Congress. Report of the proceedings of the Second Congress held at Chicago, October 18—21, 1911: with an account of the Second International Barley and Hop Prize Exhibition, and brief history of the American Exposition of brewing machinery, materials, and products. Vol. I. Chicago 1912. pp. 642. (*Reference.*) From Mr. J. C. N. Eastick.

Journal de Physique et le Radium. Vol. III., etc. Paris 1922+. (*For Circulation.*) From the Faraday Society.

KOLBE, HERMANN [Editor]. Das chemische Laboratorium der Universität Marburg und die seit 1859 darin ausgeführten chemischen Untersuchungen nebst Ansichten und Erfahrungen über die Methode des chemischen Unterrichts. Braunschweig 1865. pp. 524. ill. (*Recd.* 21/8/22.) From Professor P. Phillips Bedson.

——. Das chemische Laboratorium der Universität Leipzig und die seit 1866 darin ausgeführten chemischen Untersuchungen. Braunschweig 1872. pp. xii+668. ill. (*Recd.* 21/8/22.) From Professor P. Phillips Bedson.

KRAUS, CHARLES AUGUST. The properties of electrically conducting systems including electrolytes and metals. New York 1922. pp. 416. ill. $4.50 net. (*Recd.* 21/8/22.)

From the Publishers: The Chemical Catalog Company, Inc.

LEWIS, WILLIAM. Commercium philosophico-technicum; or, the philosophical commerce of arts: designed as an attempt to improve arts, trades, and manufactures. London 1763. pp. iv+xviii+x+646+xiv. ill. (*Recd.* 30/9/22.)

From Mr. E. Gardner.

LIND, SAMUEL COLVILLE. The chemical effects of alpha particles and electrons. New York 1921. pp. 182. ill. $3 net. (*Recd.* 21/8/22.)

From the Publishers: The Chemical Catalog Company, Inc.

LOEB, JACQUES. Proteins and the theory of colloidal behaviour. New York 1922. pp. xii+292. ill. 15*s.* net. (*Recd.* 6/7/22.)

From the Publishers: The McGraw Hill Book Company.

MALAN, H. L., and ROBINSON, A. I. The weighing and measuring of chemical substances. London 1922. pp. 64. ill. 3*s.* net. (*Recd.* 4/9/22.) From the Publishers: Messrs. Benn Brothers.

MINISTRY OF MUNITIONS and DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH. Technical records of explosives supply. No. 7. Manufacture of nitric acid from nitre and sulphuric acid. London 1922. pp. vi+86. ill. 10*s.* 6*d.* net. (*Recd.* 20/7/22.)

From the Department.

MITCHELL, CHARLES AINSWORTH. Documents and their scientific examination, with especial reference to the chemistry involved in cases of suspected forgery, investigation of disputed documents, handwriting, etc. London 1922. pp. xii+216. ill. 10*s.* 6*d.* net. (*Recd.* 21/8/22.) From the Publishers: Messrs. C. Griffin & Co.

OIL AND COLOUR CHEMISTS' ASSOCIATION. Journal. Vol. V. etc. London 1922+. (*Reference.*) From the Association.

PARTINGTON, JAMES RIDDICK, and PARKER, LESLIE HENRY. The nitrogen industry. London 1922. pp. xvi+336. ill. 21*s.* net. (*Recd.* 4/10/22.)

From the Publishers: Messrs. Constable & Co.

POLSKIEGO TOWARZYSTWA CHEMICZNEGO. Roczniki Chemji. Vol. I. Warszawa 1921. (*Reference.*) From the Society.

SCHLESISCHEN KOHLENFORSCHUNGSINSTITUT DER KAISER-WILHELM-GESELLSCHAFT IN BRESLAU. Mitteilungen. Vol. I. Berlin 1922. pp. viii+180. ill. (*Recd.* 21/8/22.)

From the Publishers: Gebrüder Borntraeger.

SCIENTIFIC AND INDUSTRIAL RESEARCH, Department of. *Food Investigation Board.* Special Report No. 7. The preservation of food by freezing with special reference to fish and meat: a study in general physiology. By WALTER STILES. London 1922. pp. 186. ill. (*Reference.*) 10*s.* net. From the Department.

SEARS, GEORGE W. A systematic qualitative chemical analysis: a theoretical and practical study of analytical reactions of the more common ions of inorganic substances. New York 1922. pp. vi+120. 8*s.* 6*d.* net. (*Recd.* 21/8/22.)

From the London Publishers: Messrs. Chapman & Hall.

SIMMONDS, CHARLES. Alcohol in commerce and industry. London 1922. pp. xii+120. ill. 3*s.* net. (*Recd.* 15/9/22.)

From the Publishers: Sir Isaac Pitman & Sons.

SINNATT, FRANK STURDY, and others. Coal and allied subjects: a compendium of the first ten bulletins issued by the Lancashire and Cheshire Coal Research Association. [1918—1921.] London [1922]. pp. viii+205. ill. 15*s.* net. (*Recd.* 9/10/22.)

From the Publishers: Messrs. H. F. & G. Witherby.

SWARTS, FRED. Cours de chimie organique. 3rd edition. Bruxelles 1921. pp. vi+674. ill. (*Recd.* 3/10/22.)

——. Cours de chimie inorganique. 3rd edition. Bruxelles 1922. pp. vi+734. ill. (*Recd.* 3/10/22.)

From the Publisher: M. Maurice Lamertin.

SWINDIN, NORMAN. Pumping in the chemical works. London 1922. pp. 80. ill. 3*s.* net. (*Recd.* 4/9/22.)

——. The flow of liquids in pipes. London 1922. pp. 64. ill. 3*s.* net. (*Recd.* 4/9/22.)

From the Publishers: Messrs. Benn Brothers.

TAYLOR, HUGH STOTT. Industrial hydrogen. New York 1921. pp. 210. ill. $3.50 net. (*Recd.* 21/8/22.)

From the Publishers: The Chemical Catalog Company, Inc.

TÔHOKU IMPERIAL UNIVERSITY. Technology reports. Vol. I., etc. Sendai 1920+. ill. (*Reference.*) From the University.

TSAO, HUI CHUN, and ADOLPH, WILLIAM H. A text-book of general chemistry. Based on McPherson and Henderson: A course in general chemistry. Shanghai 1922. pp. xxvi+653. [In Chinese.] From the Authors.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, held in the Lecture Hall of the Institution of Mechanical Engineers, on Thursday, October 26th, 1922, at 8 p.m., Sir JAMES WALKER, D.Sc., F.R.S., President, in the Chair.

Sir William H. Bragg, K.B.E., F.R.S., delivered his Lecture entitled: "The Significance of Crystal Structure." A vote of thanks to the Lecturer, proposed by Professor J. Norman Collie, and seconded by Dr. A. E. H. Tutton, was carried with acclamation, acknowledgment being made by Sir William Bragg.

Ordinary Scientific Meeting, Thursday, November 2nd, 1922, at 8 p.m., Professor J. F. THORPE, C.B.E., D.Sc., F.R.S., Treasurer, in the Chair.

Reference was made to the great loss the Society had sustained by the death, on October 28th, of Professor Alexander Crum Brown, who was elected a Fellow on December 5th, 1867. The Chairman referred to Professor Crum Brown's long connexion with the Society, of which he had served as President for two years and as Vice-President for thirty-three years, and to his many valuable contributions to the science of chemistry.

The following were formally admitted Fellows of the Chemical Society: R. A. Mallet and Owen Owen.

Certificates were read for the first time in favour of:

Leopold Louis Bacarese, 2, Stirling Road, Clapham Road, S.W. 9.
Nicholas Timothy Belaiew, C.B., 33, Elvaston Place, Queen's Gate, S.W. 7.
James Bell, 30, Trinity College, Dublin.
John Arnold Cranston, D.Sc., 14, Fernleigh Road, Newlands, Glasgow.
Hugh John Curnow, 22, Halfway Street, Sidcup.
Richard Victor Eaton, B.Sc., A.R.C.S., Lakeside, Seldown, Poole.
Roland Hall Griffith, B.A., 14, Bigwood Avenue, Hove.
Lucy Higginbotham, M.Sc., 57, Wilbraham Road, Chorlton-cum-Hardy, Manchester.
Svend Hald Lassen, Briarwood, Manorgate Road, Kingston-on-Thames.

Reginald Arthur McNicol, M.Sc., Birnam, Rotherfield Road, Carshalton.
Thomas Malkin, B.Sc., A.I.C., Golden Square, Warrington.
Thomas Trevor Potts, 60, Christ Church Square, Macclesfield.
George Clifford Riley, B.A., B.Sc., 15, Wellington Square, Oxford.
Oscar Walter Snow, B.A., Graeme's Bank, Hatch End.
Thomas John Wall, B.A., Northcote, Alexandra Road, Malvern.

The following papers were read :

"The solubility and volatility of the nitrobenzaldehydes." By N. V. SIDGWICK and W. M. DASH.

"Investigations on the dependence of rotatory power on chemical constitution. Part XIII. The spatial configuration of the unbranched aliphatic chain." By R. H. PICKARD, J. KENYON, and H. HUNTER.

"Investigations on the dependence of rotatory power on chemical constitution. Part XIV. The normal aliphatic ethers of *d*-β-octanol." By J. KENYON and R. A. MCNICOL.

"Investigations on the dependence of rotatory power on chemical constitution. Part XV. The normal aliphatic ethers of *d*-methylbenzylcarbinol." By H. PHILLIPS.

"Investigations on the dependence of rotatory power on chemical constitution. Part XVI. A new type of Walden inversion." By H. PHILLIPS.

"Investigations on the dependence of rotatory power on chemical constitution. Part XVII. The di-*d*-β-octyl esters of the acids of the general formula $(CH_2)_n(CO_2H)_2$." By L. HALL.

"Orientation of the 1 : 4- and 1 : 5-dimethylglyoxalines. Mode of fission of 5-aminoglyoxalines." By F. L. PYMAN.

"Bromo-derivatives of 2-methylglyoxaline." By L. LIGHT and F. L. PYMAN.

"2 : 5-Iminodihydro-1 : 2 : 3-triazole. Part I. Constitution of Dimroth's 5-anilidotriazole." By P. K. DUTT.

Unveiling Ceremony of the War Memorial to Lt.-Colonel E. F. Harrison, C.M.G., and other Fellows of the Chemical Society on Thursday, November 16th, 1922, at 3 p.m.

A report of the proceedings of the meeting will appear in the December issue of the Journal.

Ordinary Scientific Meeting, Thursday, November 16th, 1922, at 8 p.m., Professor J. C. PHILIP, O.B.E., D.Sc., F.R.S., Secretary, in the Chair.

Reference was made to the loss sustained by the Society, through death, of the following Fellows :

	Elected.	Died.
Edward Henry Grossmann	Dec. 5th, 1895.	Aug. 29th.
Leo Tschugaeff	Dec. 1st, 1910.	Sept. 26th.

Messrs. J. R. Green and T. Iredale were formally admitted Fellows of the Chemical Society.

Certificates were read for the first time in favour of:

Kenneth Claude Bailey, M.A., 137, South Circular Road, Dublin.
Katherine Hope Coward, M.Sc., 14, Parliament Hill, Hampstead, N.W. 3.
Allan Robert Earle, B.A., 90, Shadwell Road, Portsmouth.
Samuel Gray Fenton, 27, Somerset Road, Harrow.
Phillip Marcus Fisk, 92, Aldborough Road, Seven Kings, Ilford.
Thomas Graham, 47, Canada Road, Cardiff.
Leslie Frank Hewitt, B.Sc., A.I.C., 8, Maze Road, Kew, Surrey.
John Ingham, 19, Greyhound Road, Tottenham, N. 17.
Wilfred Herbert Linnell, B.Sc., A.I.C., 12, Highbury, Monkseaton, Whitley Bay.
Ramprasad Pitamberdas Mahta, M.A., Organic Chemistry Dept., University College, Gower Street, W.C. 1.
Jocelyn Patterson, Ph.D., M.Sc., 106, Market Street, St. Andrews.
Tara Chand Rana, M.Sc., III Bridge, Srinagar, Kashmir, India.
John Baldwin Shoesmith, M.Sc., 10, Spottiswoode Road, Edinburgh.
Reginald Ernest Tebbit, 120, Lordship Lane, E. Dulwich, S.E. 22.
Eric Wilfred Tong, B.Sc., A.R.C.S., Hollingbourne, Maidstone.
Thomas Arthur Williams, Ridgeway House, Mill Hill, N.W. 7.

A Certificate has been authorised by the Council for presentation to ballot under Bye-Law I (2) in favour of: Babu Lall Govila, Central Polytechnic Institute, Gwalior.

The meeting was then adjourned and the Informal Meeting declared open.

List of Papers received between October 20th and November 16th, 1922:

"Investigations on the dependence of rotatory power on chemical constitution. Part XIII. The spatial configuration of the unbranched aliphatic chain." By R. H. Pickard, J. Kenyon, and H. Hunter.

"Investigations on the dependence of rotatory power on chemical constitution. Part XIV. The normal aliphatic ethers of *d*-β-octanol." By J. Kenyon and R. A. McNicol.

"Investigations on the dependence of rotatory power on chemical constitution. Part XV. The normal aliphatic ethers of *d*-methyl benzylcarbinol." By H. Phillips.

"Investigations on the dependence of rotatory power on chemical constitution. Part XVI. A new type of Walden inversion." By H. Phillips.

"Investigations on the dependence of rotatory power on chemical constitution. Part XVII. The di-*d*-β-octyl esters of the acids of the general formula $(CH_2)_n(CO_2H)_2$." By L. HALL.

"Orientation of the 1 : 4- and 1 : 5-dimethylglyoxalines. Mode of fission of 5-aminoglyoxalines." By F. L. PYMAN.

"Bromo-derivatives of 2-methylglyoxaline." By L. LIGHT and F. L. PYMAN.

"The oxidation of cane sugar by nitric acid." By F. D. CHATTAWAY and H. J. HARRIS.

"Castelamarin—a bitter principle from *Castela Nicholsoni*." By L. P. BOSMAN.

"Catalytic hydrogenation with nickel. Factors determining catalytic activity." By R. THOMAS.

"2 : 5-Iminodihydro-1 : 2 : 3-triazole. Part I. Constitution of Dimroth's 5-anilidotriazole." By P. K. DUTT.

"The action of alcohol on the sulphates of ammonium." By H. B. DUNNICLIFF.

"Refraction and dispersion of potassium vapour." By A. L. NARAYAN and G. SUBRAHMANIAM.

"The interaction of diazonium salts and phenols." By F. D. CHATTAWAY and H. R. HILL.

"The relation between the crystal structure and constitution of carbon compounds. Part I. Compounds of the type CX_4." By I. E. KNAGGS.

"Binary critical solution temperatures as criteria of the purity of acetic acid." By D. C. JONES.

"Ternary critical solution temperatures as a criterion of liquid purity." By D. C. JONES.

"Syntheses of alkylidenecyanoacetic acids and of substituted succinic acids. Part II. Preparation of acids containing saturated aliphatic residues and the constitution of the aliphatic alkylidenecyanoacetic esters." By A. LAPWORTH and J. A. MCRAE.

"Formation of γ-alkylidene derivatives from ethylidenemalonic ester." By A. LAPWORTH and L. HIGGINBOTHAM.

"Resorcinolphenylsuccinein." By A. LAPWORTH and J. A. MCRAE.

"The preparation of α-trioxymethylene and a new polymer of formaldehyde." By D. L. HAMMICK and A. R. BOEREE.

"The isoelectric condition of gelatin." By S. O. RAWLING and W. CLARK.

"The nitration of 3-chloroacenaphthene." By G. FARNELL.

"The diazo-reaction in the carbazole series. Carbazole-3-diazoimine and -3-diazonium salts." By G. T. MORGAN and H. N. READ.

"The oxidation of sabinene with chromyl chloride." By G. G. HENDERSON, J. M. ROBERTSON, and D. C. BROWN.

"Scattering of light by CO_2 and N_2O, and by some organic vapours." By A. L. NARAYAN.

"1 : 3 : 4 : 6-Tetramethyl fructose." By J. C. IRVINE and J. PATTERSON.

"Researches on residual affinity and co-ordination. Part XII. Interactions of metallic salts and dimethyldithiolethylene." By G. T. MORGAN and W. LEDBURY.

"Researches on residual affinity and co-ordination. Part XIII. Cobaltammine and ferric lakes of dinitrosoresorcinol." By G. T. MORGAN and J. E. MOSS.

"Researches on residual affinity and co-ordination. Part XIV. Cobaltammine and cobaltic lakes of the azo-salicylic acids." By G. T. MORGAN and J. D. M. SMITH.

"Boundary lubrication and chemical constitution. The optically active carbinols of the formula $C_2H_5 \cdot CH(OH) \cdot C_nH_{2n+1}$." By I. DOUBLEDAY.

"The velocity of reaction in mixed solvents. Part IV. The influence of the base on the velocity of saponification of esters." By A. CASHMORE, H. MCCOMBIE, and H. A. SCARBOROUGH.

"The adsorption of radium-*B* and radium-*C* by ferric hydroxide." By J. A. CRANSTON.

"The hydrolysis of platinum salts. Part II. Potassium platinichloride." By E. H. ARCHIBALD and W. A. GALE.

"On the reactivity of methyl groups in heterocyclic bases." By W. H. MILLS and J. L. B. SMITH.

"An examination of the reputed antimonious hydroxides." By C. LEA and J. K. WOOD.

"The adsorption of stannous chloride by stannic acid." By G. E. COLLINS and J. K. WOOD.

"The composition of paraffin wax. Part III." By F. FRANCIS, C. M. WATKINS, and R. W. WALLINGTON.

"The hydrogen sulphates of the alkali metals and ammonium." By H. B. DUNNICLIFF.

LECTURE.

On Thursday, December 14th, at 8 p.m., at the Institution of Mechanical Engineers, Storey's Gate, Westminster, S.W. 1, Professor Cecil H. Desch, D.Sc., Ph.D., will deliver a Lecture entitled "The Metallurgical Applications of Physical Chemistry."

COLLECTIVE INDEX, VOL. VI (1913–1922).

Volume VI of the Collective Index, to be published in two parts, will be issued Part I in 1923 and Part II in 1924.

The price to Fellows who apply before *Christmas Day*, 1922, is £2 17*s*. post free. A remittance, made payable to Mr. S. E. Carr, must accompany the application in each case and should be sent to the Assistant Secretary, Chemical Society, Burlington House, W. 1. The price to Fellows who apply after December 25th, 1922, will be £3 7*s*.

Arrangements have been made by which cases in blue or maroon cloth for binding this Index in three volumes (Authors' Index, 1 vol. and Subject Index, 2 vols.) will be supplied for the sum of Seven Shillings. The binding will involve an additional charge of 2*s*. 3*d*. per volume. The total cost, therefore, of binding the Index in cloth will be 13*s*. 9*d*.

Fellows desiring to avail themselves of this offer should apply to Messrs. Gurney & Jackson, 33, Paternoster Row, London, E.C. 4.

CERTIFICATES OF CANDIDATES FOR ELECTION AT THE BALLOT TO BE HELD AT THE ORDINARY SCIENTIFIC MEETING ON THURSDAY, DECEMBER 7TH, 1922.

N.B.—The names of those who sign from "General Knowledge" are printed in *italics*.

ALLANSON, ROBERT, "Oaklands," 10, Grosvenor Drive, New Brighton, Wallasey, Cheshire. British. Director of Powell & Scholefield, Ltd., Chemical Manufacturers, Liverpool, and interested in research on behalf of the chemical industry and in connexion with manufacturing chemistry. (*Signed by*) R. L. Siau, Arnold R. Tankard, Douglas Henville.

ALLCHIN, THOMAS CUTHBERT, (M.B.E.), Longfield, Kent. Works manager (chemical), E. C. Powder Coy., Ltd. Manufacturing chemistry. To receive publications and attend meetings. (*Signed by*) Edgar Neumann, Matthew J. Cannon, Herbert E. Burgess.

ARMIT, JAMES WILSON, The Manse, Monikie, nr. Dundee. Chemical research student at St. Andrew's University. M.A., St. Andrews (1920). Research student in chemistry since October 1921. (*Signed by*) Robert Robinson, J. C. Irvine, John Pryde, E. L. Hirst.

BACARESE, LEOPOLD LOUIS, 2, Stirling Road, Clapham Road, S.W.9. British. Managing Chemist. (1) Two years student at the Westminster School of Pharmacy, London, S.W. (2) Passed the qualifying exam., Gibraltar. (3) Member of the Pharmaceutical Society. (4) Member of the British Optical Association and the Institute of Ophthalmic Opticians. (5) Four years Managing Chemist to Heppell & Co., London. Keenly desirous of becoming a Fellow to keep in touch and attend lectures, receive Society's publications, with a view to improving experience in Organic Chemistry.

(*Signed by*) Robert S. Glennie, W. Bennison, P. H. Woodnoth, H. Sampson Wills.

Bains, Leslie, 5, Carlton Road, Stroud Green, N.4. British. Research Student. Natural Sciences Tripos, Cambridge: Part I (1st Class), Part II (2nd Class). Two years' research in Organic Chemistry at Cambridge; now at the Imperial College of Science, South Kensington. B.A. (Cantab.), B.Sc. (London). Associate of Institute of Chemistry. (*Signed by*) Jocelyn Thorpe, C. K. Ingold, Arnold Stevenson, G. A. R. Kon.

Bathija, Menghraj Choithram, Fitzwilliam Hall, Cambridge. British subject. Student. I have remained as a student of chemistry for the last six years at the universities of Bombay and Cambridge, respectively, and have obtained Honours degree of Bombay in chemistry and physics, and 2nd Class Honours degree of Cambridge in chemistry, physics, and botany. (*Signed by*) H. J. H. Fenton, A. J. Berry, T. M. Lowry.

Belaiew, Nicholas Timothy, Colonel, C.B., 33, Elvaston Place, Queen's Gate, London, S.W.7. Russian. Metallurgist. Formerly Lecturer in Chemistry and Metallurgy at the Michael Artillery Academy, Petrograd. Colonel, C.B., M.I.Met., M.I.Min.E., Hon. M.I.Ae.E. Honorary Corresponding Fellow of the Royal Society of Arts. Honorary Corresponding Member of the Council of the Institute of Metals. Member of the Council of the I. Aeronautical Engineers. Member of the Iron and Steel Institute, the Faraday Society, the Society of Chemical Industry, and of the Mineralogical Society. Member of the Société de Chimie Physique in Paris. In Russia member of Society of Physics and Chemistry, Imp. R. Mineralogists and others. Contributor of several papers on chemistry, physics, and crystallography. (*Signed by*) H. C. H. Carpenter, W. J. Pope, R. A. Hadfield.

Bell, James, 30, Trinity College, Dublin. British. University Demonstrator of Chemistry. Senior Moderator in Experimental Science (with large gold medal for first place and high marks), Dublin University, 1920. Demonstrator of chemistry, Dublin University, 1919–1922. Part author of two papers on original research, viz. *J. Chem. Soc.*, **117**, 1133, (1920), and *J. Chem. Soc.*, **121**, 1790, (1922). (*Signed by*) Sydney Young, Emil A. Werner, A. G. G. Leonard.

Broome, Donald Charles, "Disgwylfa," Penmaenmawr, North Wales. British. Technical Chemist. Educated at Emanuel School, Wandsworth Common, and later at Woolwich and Battersea Polytechnics. Have passed Inter. B.Sc. (London) and am studying for final B.Sc., having completed one year's work for this examination. Late chief assistant chemist at the South Met. Gas Co.'s Tar Works, East Greenwich. Now holding the post of works chemist at the Penmaenmawr works of the Penmaenmawr and Trinidad Lake Asphalt Co., Ltd. (*Signed by*) M. O. Forster, J. Kenyon, J. L. White, Herbert E. Nickels, *Wallace C. Nickels.*

Buist, Walter Ferguson, 24, New Hall Lane, Clubmoor, Liverpool. Scotch. Graduate. Awaiting teaching post. Northern Universities Matriculation 1913. Inter.B.Sc., University of Liverpool, 1914. (War service 1914–1920.) Honours chemistry, B.Sc., 1922. Desirous of keeping in touch with current literature. (*Signed by*) E. C. C. Baly, Herbert H. Froysell, I. M. Heilbron, J. S. Buck.

Bult, Stanley Robert, 63, Addiscombe Rd., Croydon. British. Chemist. At present time Curator, Institute of Hygiene, lecturing and demonstrating upon dietetic and hygienic problems. Twenty-two years' experience of chemistry (with break during the war). Seventeen years' laboratory work, oils, waxes, soaps, paints, metals, rubber, foodstuffs. Some

small contributions to technical journals. (*Signed by*) Herbert J. Bult, Lawrence Briant, Julian L. Baker.

BURFORD, ARTHUR JOSIAH, c/o 419, Edgware Rd., Maida Vale, W.2. British. Chemist and Druggist. (1) Two years student in chemistry at the School of Pharmacy of the Pharmaceutical Society, Bloomsbury Square, W.C. (2) One year student in pharmaceutical and analytical chemistry at the London College of Chemistry and Botany, S.W. (3) Member of the Pharmaceutical Society. (4) Three years laboratories of Wands, Manufacturing Chemists, Leicester. (5) Three years chemist to Heppell & Co., London. (6) Keenly desirous of becoming a Fellow to keep in touch and attend lectures, receive Society's publications, with a view to improving experience in Pharmaceutical Organic Chemistry. (*Signed by*) William Bennison, Gabriel Cofman-Nicoresti, Robert S. Glennie.

BURROWS, GEORGE JOSEPH, Chemical Department, University, Sydney, N.S.W. B.Sc. Sydney (1910). Lecturer in Chemistry, Sydney University. Author of various publications in *J.C.S.* since 1914. (*Signed by*) Eustace E. Turner, Charles E. Fawsitt, J. A. Schofield.

CARTER, WILLIAM LESLIE, "Ellesmere," Bloxcidge St., Langley Green, nr. Birmingham. British. Works Chemist (in charge). Educated at the Secondary School, Oldbury (by county scholarship). Oxford Univ. local exam. honours and distinction in chemistry. 1915, Assistant chemist, Messrs. Chance & Hunt, Ltd., Oldbury, Chemical Mfrs. 1916, Assistant chemist, Messrs. J. Hardman, Ltd., Birmingham, tar distillers. 1917, Assistant chemist, H.M. factory site "B," Oldbury. 2½ years' military service (France). 1921, Board of Education higher education course in advanced chemistry. 1922, Chemist-in-charge, Messrs. Birmingham Starch & Mfg. Co., Ltd., Birmingham. Paper in preparation on "The Manufacture of Starch." (*Signed by*) J. G. Howarth, Arthur Adams, Joseph Lones.

CAVIGAN, SYDNEY GEORGE, 22, Walker St., Burton-on-Trent. Analytical Chemist. I have had five years' experience in the analysis of metals, foods, and drugs, and general experience in biological chemistry and toxicology, and am at present in charge of the analytical department of Messrs. Evans, Sons, Lescher & Webb, Research Laboratories, Runcorn. I wish to become a member in order to obtain the *Journal* to assist me in my researches, and to keep up my knowledge of modern chemical literature. (*Signed by*) Wm. P. Skertchly, James Booth, J. Turnbull, Herbert H. H. Lorenz.

CHAMPION, JOHN HARDWICK LONG, 41, Triangle West, Clifton, Bristol. Student. Bachelor of Science (Bristol). Have done eight months' research in physical chemistry under Prof. J. W. McBain. Am at present engaged as a part-time teacher of chemistry and physics. (*Signed by*) J. W. McBain, M. Nierenstein, Millicent Taylor, B. Fullman.

CHOUDARY, KATRAGADDA SESHACHALAM, 71, Coral Merchant St., George Town, Madras, India. Indian (Hindu). Leather Trades Chemist. Master of Arts of the University of Madras, Master of Science of the University of Leeds; lecturer in chemistry in the Christian College, Madras (1917–18); lecturer in chemistry in the Government Arts College, Rajahmundry, Madras; (1918–19); chemist in the Leather Trades Institute, Madras (1919–20). (*Signed by*) P. K. Dutt, Akira Shimomura, H. M. Dawson.

CHRISTIE, ELLIOT MARTIN, 37, Lynwood Avenue, Dunedin, N.Z. Secondary School Teacher. Graduated B.Sc., Victoria University College, 1920. M.Sc. (2nd Class Honours in Chemistry), 1922. Thesis on "Oxidation of Unsaturated Organic Compounds by Persulphate." Appointed Science Master, Gore High School, 1922. (*Signed by*) J. K. H. Inglis, John Williams, C. S. Hicks.

CLARKE, FREDERICK STANLEY, 64, Golders Manor Drive, N.W.11. British. Pharmaceutical Chemist. 1899, Demonstrator (chemistry and pharmacy), Manchester. From 1900, 2½ years with the late Wm. Martindale, editor, *Extra Pharmacœpeia*. 1902 to 1920 on technical experimental staff, Burroughs, Wellcome & Co., London. At present works manager and chemist, Anglo-American Oil Co.'s Speciality Dept. for petroleum products. (*Signed by*) Harold King, Harold C. Sayer, Frank Lee Pyman.

COTTRELL, ALLIN, 3, Oxford Terrace, Edinburgh. British. Lecturer in Technical Chemistry, Edinburgh University. Lately chief chemist, H.M. Factory, Gretna. (*Signed by*) James Walker, Sydney A. Kay, Leonard Dobbin.

CRANSTON, JOHN ARNOLD, 14, Fernleigh Road, Newlands, Glasgow. British. Lecturer on Physical Chemistry, Royal Technical College, Glasgow. Doctor of Science, Glasgow University. Lecturer in Royal Technical College for three years. (*Signed by*) F. J. Wilson, Thomas Gray, R. M. Caven.

CURNOW, HUGH JOHN, 22, Halfway St., Sidcup. English. Undergraduate. Inter. Science (London). Student of the Institute of Chemistry. (*Signed by*) H. Pochin, J. R. Partington, W. H. Patterson.

DANCE, EDWARD, Castle Inn, Sandal, Wakefield. British. Student. B.Sc. Hons. in Col. Chem., Leeds, and Diploma in Dyeing, Leeds University. Desire Fellowship in order that I may receive the *Journal* and have use of Library. (*Signed by*) R. M. Woodman, J. R. Scott, P. W. Clutterbuck, John S. Carter.

DAVIES, WILFRED THOMAS GREY, Plas-y-Coed, Derllwyn Rd., Tondû, Glamorgan. British. Assistant, Tondû By-product Works. B.Sc., Bristol, 1920. Inter.B.Sc., 1914. Carried out research under Dr. M. Nierenstein at Bristol University. (*Signed by*) M. Nierenstein, M. Taylor, F. Francis, J. W. McBain, B. Fullman.

DEWHURST, MILTON, 1280, Warwick Rd., Acocks Green, Birmingham. British. Works Chemist. B.Sc. Hons. Chemistry (Vict.). A.I.C. (*Signed by*) H. B. Dixon, Arthur Lapworth, F. P. Burt, Frederick Challenger, John Harwood.

EATON, RICHARD VICTOR, "Lakeside," Seldown, Poole. British. Chemist, R.N. Cordite Factory. A.R.C.Sc., B.Sc. (Lond.). (*Signed by*) H. B. Baker, M. A. Whiteley, James C. Philip.

EVERS, NORMAN, The Cottage, Salisbury Avenue, Cheam, Surrey. British. Chemist. B.Sc. (London), F.I.C. Chief chemist to Messrs. Allen & Hanbury's, Ltd., Bethnal Green, E.2. Author of numerous papers on chemical subjects published in the *Analyst* and elsewhere. (*Signed by*) F. W. Gamble, G. J. Woods, Thos. McLachlan.

FARMERY, JOSHUA WILLIAM, 56, Sheen Rd., Richmond, Surrey. British Analytical and Research Chemist. M.A. (Cantab.). A.I.C. Research paper, "Decomposition of Nitric Esters," by Lowry, Browning, and Farmery, *J.C.S.* (*Signed by*) T. M. Lowry, A. F. Joseph, Cecil H. Cribb.

FORD, SAMUEL FREDERICK, 65, Abbotts Road, Southall, Middlesex. British. Assistant Chemist. (Analysis of oils, essences, and foods.) Assistant for three years in laboratory of rubber and antimony manufacturer. Now assistant chemist in laboratory of food manufacturers. Ex-day and now evening student at Battersea Polytechnic. Studying for Science degree. Rutlish Secondary School, Merton, Old Boy. (*Signed by*) F. J. Wilson, G. S. W. Marlow, J. Beauchamp Salter.

GARDNER, ROY, 91, Lincoln Rd., Masterton, N.Z. Honours Student (Chemistry), University College, Otago, N.Z. Desirous of keeping in touch with recent developments. B.Sc. (N.Z.), now doing research work in chemistry

at Univ. of Otago, N.Z. (*Signed by*) Fredk. P. Worley, W. F. Short, A. H. Bowell, J. K. H. Inglis, Thomas H. Easterfield.

GIFFORD, PHILIP HENRY, Boys' High School, Salisbury, S. Rhodesia, S. Africa. Science Master. B.Sc. (Vict.) (1st Class Chemistry and Physics). Assistant Science Master, Ballymena Academy, Co. Antrim (1913–14). Senior Science and Maths. Master, Edinburgh Institution (1914–17 and part of 1919). Senior Science Master and Vice-Principal of the Boys' High School, Salisbury, S. Rhodesia, from Jan. 1st, 1920. (*Signed by*) Charles A. Fogg, T. M. Nightingale, E. Boardman.

GRIFFITH, ROLAND HALL, 14, Bigwood Avenue, Hove, Sussex. British. B.A. (Chemistry), Oxford. Engaged on research in organic chemistry at the University laboratories. (*Signed by*) Edward Hope, W. H. Perkin, S. G. P. Plant, Allan F. Walden, N. V. Sidgwick, M. P. Applebey, B. Lambert.

GRIFFITHS, REGINALD WILLIAM, 137, Holly Road, Handsworth, Birmingham Member of Research Staff, Research Laboratory, Dunlop Rubber Co., Ltd., Fort Dunlop, Birmingham. Research student at Birmingham Municipal Technical School. B.Sc. (Birmingham), 1920. (*Signed by*) J. Newton Friend, Frederick Challenger, J. E. Coates, S. R. Carter, G. T. Morgan.

GULLAND, JOHN MASSON, 11, Chester Street, Edinburgh. Chemical Research Student. B.Sc. in pure science, Edinburgh University, July 1921. Research student, Chemistry Department, University of St. Andrews. (*Signed by*) Robert Robinson, J. C. Irvine, John Pryde, E. L. Hirst.

HAIGH, HERBERT, 211, Park Road, Barnsley, Yorkshire. British. Student (Graduate). Alternative Matriculation for ex-service men, 1919. Inter. B.Sc., Liverpool, 1920, Maths., Physics, and Chemistry. B.Sc. Liverpool, 1922, Honours Chemistry, Class I. Desirous of keeping in touch with current literature. (*Signed by*) I. M. Heilbron, E. C. C. Baly, Herbert H. Froysell, Harold Rogerson, J. S. Buck.

HIGGINBOTHAM, LUCY, 57, Wilbraham Rd., Chorlton-cum-Hardy, Manchester. British. Research Assistant in Organic Chemistry at the British Cotton Research Association, Didsbury. B.Sc., Honours Chemistry, 1st Class, 1919, at Manchester University. M.Sc., 1920. Working for Dr. Stephens at Manchester University. 1921–22 Private assistant to Professor Lapworth. Publications: "The Formation of Substituted Succinic Acid from Esters of $\alpha\beta$-Unsaturated Esters," by Arthur Lapworth and Lucy Higginbotham; "Studies in the Coumaranone Series. Part I," by Lucy Higginbotham and Henry Stephen. (*Signed by*) Arthur Lapworth, Frederick Challenger, Leslie R. Ridgway, R. G. Fargher.

HUBBARD, THOMAS EDWARD, 9, Cunliffe Street, Pendleton, Manchester. Senior Assistant Chemist to the Salford Corporation Gas Works. As a student at the College of Technology, Salford, gained numerous prizes and scholarships in chemistry. Deputised for Mr. C. E. Teasdale, lecturer on gas manufacture. Lectured on calorimetry in modern gas works practice, etc. (*Signed by*) Jas. Grant, E. Bayley, Frank B. Small.

HUMPHRIES, JAMES ERNEST, 29, St. John's Rd., Newport, Mon. British. University Assistant in Chemistry, Aberdeen. B.A. (Lond. and Cantab.). M.Sc. (Wales). (*Signed by*) W. Thomas, E. Bloom, F. G. Mann.

HUNTLEY, JOHN, The Villa, Burstwick, nr. Hull. Works Chemist. Chief chemist, Humber Portland Cement Co., Ltd., Melton, East Yorks. (*Signed by*) W. H. Coates, Harry Thompson, Thos. A. Nightscales, E. B. Atkinson, T. Luxton.

HURREN, SYDNEY ALFRED, M.C., 39, Upper Marylebone St., W.1. British.

Lecturer at Northern Polytechnic Institute on Technology of Pianoforte Construction, and technical editor of *The Pianomaker*, the monthly journal of the trade. (*Signed by*) Thomas J. Drakeley, Philip Schidrowitz. Raymond R. Butler.

ISKANDER, HABIB, Heliopolis, Cairo. Egyptian. Senior Science Master of the American University, Cairo, Intermediate Section. Graduate of Royal Training College, Cairo, with top mark in chemistry, 1915. Late Senior Chemistry Master at Victoria College, Alexandria, 1915–21. (Victoria College is an English College qualifying for the Oxford and Cambridge Schools Examinations.) Author of "Khoulasit Al Chemia," an Arabic text-book in chemistry adopted by many schools and colleges. Contributor of some articles on "Recent Advances in Chemical Science" published in *Al Moktataf*, the biggest scientific magazine in the Arabic-speaking world. (*Signed by*) A. I. Kahil, A. H. Ahmad, W. Morris Colles, R. Fleming.

JENKIN, JOHN WATSON, "Tregardock," St. Austell, Cornwall. Metallurgical Research Chemist. B.Sc. (Hons.) London (2nd Class Hons. in Chemistry). A.I.C. (by examination). Studied chemistry at King's College, London, under Professors Crossley, Smiles, and Allmand. At present engaged in research work under Professor C. H. Desch in the Dept. of Metallurgy, University of Sheffield. (*Signed by*) Cecil H. Desch, A. J. Allmand, Samuel Smiles.

JEWELL, JOHN ERNEST, 34, Grove End Road, St. John's Wood, N.W.8. English. Pharmaceutical Chemist. Proprietor of Messrs. Heppell, West-end chemists. Member of the Pharmaceutical Society. Director of many well-known chemical firms. (*Signed by*) Frank Radcliffe, Stanley J. Peachey, C. S. Gibson.

JONES, EDGAR, Milverton House, 167, Upper Dale Road, Derby. Technical Chemist. Chief chemist, Derby Gas Light & Coke, Co. Late chemist Gas Helmet Redipping Station, R.A.O.D., Alexandria. Inter. B.Sc. (London). Lecturer, Gas Engineering and Manufacture, Derby Technical College. (*Signed by*) Jos. Yates, Cyril H. Birkitt, Stanley Dixon.

KALFF, JAN, Amsterdam, Nieuwe Prinsengracht 126. Dutch. Assistant, University, Amsterdam. Chem. Doct. Engaged in organic chemical work. Desire to keep up with the latest English investigations in chemistry. (*Signed by*) H. J. Backer, W. A. Frederikse, F. G. Donnan.

KAPUR, SHANKAR NATH, Amritsar, India (at present, 5, Grosvenor Crescent, Edinburgh). Distillery Chemist, Amritsar Distillery Co., Amritsar, India. B.Sc. 1st Class Honours in Chemistry from Government College, Lahore (Punjab University). Chemist to the Amritsar Distillery Co., Amritsar, India (from May 1917). Now sent by the Government of India to study "Industrial Alcohol" in England and on the Continent. (*Signed by*) John E. Mackenzie, Thomas H. Pope, B. H. Wilsdon, *Bawa Kartar Singh*, *Horace B. Dunnicliff*.

KHAN, GHULAM SAFDAR, Veterinary College, Lahore. Lecturer in Chemistry, Veterinary College, Lahore. Passed B.Sc. examination in 1920 from Punjab University. Appearing in the M.Sc. examination 1922. Special work: (1) Separation of different qualities of turpentine oil. (2) Solubility of sulphur dioxide in sulphuric acid of different concentration at constant temperature. (*Signed by*) S. R. Khosla, N. A. Yajnik, E. T. Dean.

LASSEN, SVEND HALD, "Briarwood," Manorgate Rd., Kingston-on-Thames. Danish. Works Manager. Graduated at the University of Copenhagen. Assistant lecturer at the Royal Mineralogical Museum, Copenhagen, 1913–14. Participated in an Arctic expedition to North Greenland as mineralogist. At

present works manager to Water Softeners, Ltd. (synthetic aluminium silicates and dyestuffs). (*Signed by*) Harald Faber, Bernard Dyer, Robt. G. Grimwood.

LLOYD, WILLIAM DAWSON, 42, Tavistock Road, Westbourne Park, W.11. Medical, Veterinary, and Pharmaceutical Representative. Fifteen years' analytical and pharmaceutical experience—manufacture of bismuth salts, urine analysis, etc. (*Signed by*) A. E. Mills, Geo. A. Pemberton Wright, Herbert A. Mills.

LYNCH, PHILIP PATRICK, Church Street, Timaru, N.Z. Medical Student. B.Sc. (N.Z.). First and second professional examinations for degrees M.B., Ch.B. (N.Z.). 1918 Asst. Chemist, Department of Agriculture, Wellington. At present assistant to C. S. Hicks, M.Sc., A.I.C., Public Analyst, Dunedin (Fellow). Engaged in biochemical research on goitre, nephritis, and diabetes under Professor of Pathology at University of Otago and in collaboration with C. S. Hicks, M.Sc. (Fellow). (*Signed by*) C. S. Hicks, Thomas H. Easterfield, Fredk. P. Worley, J. K. H. Inglis.

MACALPINE, FRANCIS GEOFFREY, Broad Oak, Accrington, Lancs. British. Managing Director of Coal-Tar Distillation and Ammonia Works. Degree of B.Sc. of Manchester University. Twelve months' study of coal carbonisation and working up of by-products at Birchenwood Collieries, Kidsgrove. I desire to join the Chemical Society so as to be kept informed of the progress of chemistry through the Transactions of the Society and its Library. (*Signed by*) B. Prentice, E. Clark, D. V. Hollingworth.

MCDOWALL, FREDERICK HENRY, Knox College, Dunedin. Research Student, Otago University. M.Sc. with 1st Class Honours. Thesis on "Constitution and Synthesis of Menthol." Smeaton Research Scholar of Otago University, 1921–22. Student demonstrator and half-time assistant to Dr. Inglis in Chemistry Department, Otago University, 1919, 1921–22. (*Signed by*) J. K. H. Inglis, C. L. Carter, C. S. Hicks.

MCKENZIE, KENNETH, "Endrick," Hamilton Rd., Cambuslang. Scotch. Analytical Chemist. For the past ten years engaged in the study and practice of analytical chemistry. Training: at Royal Technical College, Glasgow, and with Messrs. R. R. Tatlock & Thomson, Public Analysts, Glasgow. At present assistant chemist with Lantaro Nitrate Co., Ltd., Chile, with complete control of all analytical work. Desirous of joining Chemical Society for purpose of keeping in touch with advances in analytical chemistry. Originator of method for determination of perchlorates in small quantities in caliche, etc. Refinement of ferrous sulphate assay for nitrate in caliche, whereby experimental error is reduced from $\pm 4\%$ to $\pm 0{\cdot}6\%$. (*Signed by*) R. T. Thomson, A. R. Campbell, George Grant, Alex. W. McLaren.

MCNICOL, REGINALD ARTHUR, "Birnam," Rotherfield Road, Carshalton, Surrey. British. Bio-chemist to the Jersey Tomato and Fruit Preserves, Ltd., St. Heliers, Jersey (J. Lyons & Co.). Pupil Sutton (Surrey) County Secondary School, Sept. 1912–July 1916. Student Battersea Polytechnic, Sept. 1916–June 1922. B.Sc. Lond. (3rd Class Hons. in Chemistry), Oct. 1920. M.Sc. Lond., May 1922. Thesis: "The Preparation and Optical Properties of the Aliphatic Ethers of Secondary Octyl Alcohol." (*Signed by*) Leslie Hall, J. Kenyon, Harold Hunter, J. L. White.

MALKIN, THOMAS, Golden Square, Warrington. British. Research Student in Chemistry, Victoria University, Manchester (Ph.D. candidate). B.Sc. (London), Hons. Chemistry. A.I.C. Two years' post-graduate research at College of Technology, Manchester. Part-time lecturer in chemistry at Warrington Technical Institute, 1920–22. (*Signed by*) Arthur Lapworth, Frank Lee Pyman, Leslie Randal Ridgway.

MARTIN, ARCHIBALD ROY HAMMOND, 8, Kingsland Rd., Worthing, Sussex. British. Student. At St. John's College, Cambridge, read for Nat. Sci. Tripos, Part I, for 2 years, taking the B.A. degree in June, 1921. Read for Nat. Sci. Tripos, Part II, in chemistry for 1 year, passing in Class 3. (*Signed by*) W. G. Palmer, T. M. Lowry, Charles T. Heycock.

MATTHEWS, JOSEPH KEITH, M.A. (Cambridge), Cedric House, Rainhill, Lancashire. British. Fuel Technologist (Messrs. Pearson & Knowles Coal & Iron Co., Warrington, Lancs.). 1908, 1st Class Honours in Natural Sciences Tripos, Camb. (including chemistry). 1909, 2nd Class Honours in Part II Chemistry Tripos, Camb. From 1909 the applicant has been in a responsible position in chemical industry, first with Messrs. Pilkington Bros. and later with the above-named firm. (*Signed by*) A. J. Berry, Charles T. Heycock, S. R. Adcock, W. E. S Turner.

MOORHEAD, CHARLES WILLIAM, 23, Newbridge Rd., Bath. Chemist to Meldon Valleys Co., Ltd. Twenty-five years' experience in drug and chemical trades, glass technology, manufacturing chemistry. (*Signed by*) Alan E. Gardiner, Alfred Mander, A. E. Mills.

MOSS, JOHN EWART, 298, Franklin Road, Kings Norton, Birmingham. Research Student. B.Sc. (1st Class Honours in Chemistry) and M.Sc. (Birm.). (*Signed by*) G. T. Morgan, S. R. Carter, Wm. Wardlaw, E. Ashley Cooper, C. J. V. Bews, J. D. Main Smith.

NATH, DINA, Jullundhur City (Punjab), India. At present assistant chemist to Bhatni Sugar Works, Gorakhpur (District), United Provinces, India. Graduate in Science of the Punjab University. Specialist in soap manufacture. Written a paper on soapmaking with special reference to Indian conditions. At present working on "The Action of Alkalies on Rosine under Different Conditions." Certificate from the Professor-in-Charge with regard to the ability in applied chemistry is attached herewith. (*Signed by*) Bhagwan Das Batta, N. A. Yajnik, E. T. Dean.

NIELSEN, TORKILD HAASTRUP, Knockhall Lodge, Greenhithe, Kent. Danish. Chemist at Kent Cement Works of the Associated Portland Cement Manufacturers, Limited. Bachelor of Science in chemical engineering from the Royal Technical College in Copenhagen. (*Signed by*) H. Baggesgaard Rasmüssen, Chr. Winther, J. J. Fox, S. P. L. Sörensen.

NISHIKAWA, HIDEJIRO, 3, Hachimancho, Asakusa, Tokyo, Japan. Japanese Government Research Scholar. Graduate of the section of agricultural chemistry of the Agricultural Department of the Imperial University of Tokyo, Japan. Research student of the Chemistry Department, St. Andrews University. (*Signed by*) Robert Robinson, J. C. Irvine, John Pryde, E. L. Hirst.

NOMURA, HIROSHI, Chemical Institute, Imperial University, Sendai, Japan. Japanese. Assistant Professor of Chemistry. Graduated at the Tokio Imperial University of Japan, engaged in research for one and a half years under Professor W. H. Perkin. Assistant Professor of Chemistry, Tohoku University, since 1914. (*Signed by*) W. H. Perkin, E. Hope, S. G. P. Plant, E. N. Allott, W. Davies, A. F. Titley, Thos. H. Durrans.

PAGE, ALBERT BRAMAH PEARCE, 27, Tanza Road, Hampstead, N.W.3. Research Student. Associate Royal College of Science. I desire to keep in touch with chemical progress through the *Journal* of the Society. (*Signed by*) James C. Philip, H. J. T. Ellingham, Olive Workman.

PICKLES, HAROLD, Gasworks, Kildwick, nr. Keighley. Chemist and Assistant Engineer, Keighley Corporation Gasworks. Studied chemistry (theoretical, practical, and industrial) at Keighley Trade and Grammar

School, Halifax Technical College, and Leeds University. Nine years' laboratory experience as gasworks chemist. Contributed papers to the *Gas World* on the properties of gaseous mixtures. (*Signed by*) H. Harper, Wm. Cranfield, John Wilkinson.

POOLEY, JOSEPH EDWARDS, 1, Margaretting Road, Manor Park, E.12. British. Principal, "Sandringham" Central School, Forest Gate, E.7. Trained Certificated Teacher. Inter. B.Sc. (London), chemistry as a subject. Inter. B.Sc. (Econ.), London. L.C.P. (chemistry as a subject). B. of E. Certs. in P. and T. Chemistry, advanced stage. Science lecturer at Woolmore St. L.C.C. Evening Institute, Sessions 1914–18. (*Signed by*) Evan D. Griffiths, Léon E. Walling, Alfred W. J. Denney.

POTTS, THOMAS TREVOR, 60, Christ Church Square, Macclesfield. British. Chemist to Messrs. Robert Fletcher & Son, Ltd., Kearsley Paper Works, Stoneclough, and Greenfield Paper Mill, Greenfield, Yorks Educated at Macclesfield Grammar School (science student under Fisher Advanced Courses Scheme). Matriculated 1917. Part-time student, Manchester Municipal College of Technology in Chemistry and Technology of Paper Manufacture. Held above post from August 1919, since when I have been engaged in general chemical control of processes and private research work in chemistry as applied to the manufacture of high-grade tissues, including original work on new processes of manufacture and methods of analysis. (*Signed by*) William Bacon, Alfred Holt, Julius Hübner.

POUND, JAMES ROBERT, 601A, Dana St., Ballarat, Victoria, Australia. Lecturer in Chemistry, the School of Mines, Ballarat. M.Sc. (Melb., Chemistry). Author of papers on Ether and Sulphuric Acid, Trans., 1911 and 1922, and on Treatment of Wolfram Ores, *Proc. Australian Inst. Min. Met.*, 1919. Formerly research chemist at Amalgamated Zinc (De Bovay's), Ltd., Broken Hill, N.S.W., and superintendent of Magnetic Separation Works, S. & M. Syndicate, Ltd., Launceston, Tas. (*Signed by*) Orme Masson, A. C. D. Rivett, D. Avery.

PRASAD, NAGE DRA, Ranchi, Behar and Orissa, India. Deputy Collector. B.Sc. with Honours in Chemistry. M.Sc. with Thesis and Organic Chemistry as the special subject. Joint author of "Iodination by means of Nitrogen Iodide or by means of Iodine in presence of Ammonia," published in the *Journal of the American Chemical Society*, Vol. XXXIX, 1917. Worked as a research student for some time at the Agricultural Research Institute at Pusa; has a private laboratory of his own; wants to be in touch with current literature on chemistry. (*Signed by*) Phuldeo Sahay Varma, A. S. Khan, Chandra Bhushan Roy, R. L. Datta.

PRIDEAUX, EDMUND BRYDGES RUDHALL, 6, Arboretum Street, Nottingham. British. M.A. and B.Sc. (N.Z.), D.Sc. (Lond.), F.I.C. Lecturer in Chemistry and Research Chemist at University College, Nottingham. Research falls mainly under the following heads: The compounds of fluorine; the atomic and molecular volumes of liquid elements and their liquid compounds; electrochemical investigations of solutions by the conductivity and electromotive force methods, with special reference to acidity and alkalinity; electrolytic corrosion; the evaporation and deliquescence of salt solutions; the chemical factors controlling the alkalinity of sea water. My books deal with the arithmetical problems of physical chemistry and with the theory and control of acidity and alkalinity, with special reference to the use of indicators. (*Signed by*) F. Stanley Kipping, F. G. Donnan, A. J. Allmand.

PULLEN, ALFRED NORMAN DOUGLAS, The Larches, Greenham Common,

Newbury. English. Late Analyst to China Mining and Metal Co., Ltd., Hong Kong. In charge of smelting and refining works to above Co., 1918–22. Pharmacist to Hong Kong Government, 1914–17, and assistant analyst, 1915–16. Assistant to T. Tickle, B.Sc., F.I.C., Boro' Analyst, Exeter, 1912–13. Major Diploma, Pharmaceutical Society and silver medallist (chem.). 1912. Paper on "Iodine Ointment," *Pharm. Journ.*, Nov. 16th, 1912. (*Signed by*) A. W. Crossley, Thomas Tickle, Frank Comyns.

RILEY, GEORGE CLIFFORD, B.A., B.Sc., 15, Wellington Square, Oxford. British. Research Chemist. Works chemist on production of explosives, 1915–19. Student at Oxford University, 1914–15 and 1919–21, taking 2nd Class Honours, Final Honours Chemistry School, and B.A. 1920. One year's research work in organic chemistry and B.Sc. degree, 1921. Research assistant to Professor W. H. Perkin, M.A., F.R.S., 1921 to present date. Publication: "The Chlorination of Benzoyl Chloride" (with Edward Hope), accepted for publication in the *Journal* of the Society. (*Signed by*) W. H. Perkin, N. V. Sidgwick, E. Hope, W. Davies, A. F. Titley, D. Ll. Hammick, S. G. P. Plant.

ROBERTSON, THOMAS ABRAHAM, "Sassafras," Rickard Road, Bankstown, N.S.W. Chemist and Manager, Austral Starch Co., Nelligen, N.S.W. Student at Sydney Technical College in Inorganic Chem. complete course, Theory and Practical. Organic Chemistry 3 years, 1907–13. Matriculated for Sydney University, 1914. Assist. in Physiological Research Lab., Sydney University, for 2 years, 1910–12. Member of Sydney Technical College Chemical Society for 8 years. Special representative of commercial firms for 2 years. At present Organic Chemist and Manager of Austral Starch Co., Nelligen, N.S.W. Paper and exhibits before Sydney Tech. Coll. Chem. Society: "Chemical Substances in Human Body" and "Glandular Secretion of Iodine in Blood Stream;" other papers in course of preparation. (*Signed by*) Richard W. Challinor, Arthur R. Penfold, Archibald D. Ollé, Robt. Grant, George Z. Du Pain.

RUSHWORTH, BURKE, 4, West Park Terrace, Healey, Batley, Yorks. English. Manager, Chemist Department, Batley Co-operative Society, Ltd. Certificate winner Army Science College, Bonn University, Germany, having studied there after the armistice. Ex-student S.W. Polytechnic Institute, Chelsea, having taken the Minor Pharmaceutical Exam. Now working for the Major and F.S.M.C. diplomas. (*Signed by*) C. Morton, F. H. Lowe, F. Arnall.

SCHOLEFIELD, ARTHUR, Poulton Hey, Bromborough, Cheshire. British. Director of Powell & Scholefield, Ltd., Chemical Manufacturers, Edge Hill, Liverpool. Interested in the chemical industry, and desirous of keeping in touch with scientific research. (*Signed by*) Harold Rogerson, E. C. C. Baly, I. M. Heilbron.

SINGH, GOPAL, "The Brij," Gawalmandi, Lahore, India. Indian. Professor of Chemistry, Dyal Singh College, Lahore. B.Sc. with Honours in Chemistry, M.Sc. 1st Class First. For some time research student of the Punjab University. For about 2½ years Professor of Chemistry at the Dyal Singh College, Lahore. Joint author of the paper (*J.C.S.*, T., 1920, p. 980). Author of the paper (*J.C.S.*, T., 1922, May, p. 782) "Phototropy of Inorganic Salts, Cuprous Chloride, and Bromide." (*Signed by*) N. A. Yajnik, Horace B. Dunnicliff, Tara Singh Mahal.

SMITH, GEORGE VICTOR, Westleigh, Eggington Rd., Wollaston, Stourbridge. British. Student. A.R.C.S. (Chemistry). Formerly Assistant Master, King Edward VI. Grammar School, Stourbridge. (*Signed by*) James C. Philip, M. A. Whiteley, H. F. Harwood, J. N. Sugden, J. G. Howarth.

SNEDKER, STANLEY JAMES CORRALL, "The Rowans," Wood Hey, Rock

Ferry, Cheshire. Senior Assistant, Department of Organic Chemistry, University of Liverpool. Carrying out original research. I wish to keep in touch with current chemical literature. (*Signed by*) E. C. C. Baly, I. M. Heilbron, Harold Rogerson, J. S. Buck.

SNOW, OSCAR WALTER, Graeme's Bank, Hatch End, Middlesex. British. Research Student. B.A. (Oxon.) [Part I, Final Honours School of Chemistry]. Scholar of New College, Oxford. At present engaged in research for Part II. (*Signed by*) W. H. Perkin, S. G. P. Plant, N. V. Sidgwick, Allan F. Walden, E. Hope.

STOYLE, FRANCIS WILBERT, 37, Kansas Avenue, Belfast. British. Student. B.Sc. (1st Class Hons.), Queen's University, Belfast, 1921. M.Sc. Queen's University, Belfast, 1922. (*Signed by*) Robert Robertson, A. W. Stewart, H. Graham.

THEOBALD, LESLIE STUART, 3, Ennismore Avenue, Chiswick, W.4. Student. A.R.C.S. course in chemistry just completed. (*Signed by*) James C. Philip, H. F. Harwood, J. N. Sugden.

THOMPSON, WILLIAM, "Ravensworth," Cockton Hill, Bishop Auckland. Student. Bachelor of Science, University of Durham. Degree obtained June 1922. (*Signed by*) P. Phillips Bedson, W. N. Haworth, Grace C. Leitch.

TIMMIS, LAURENCE BARNETT, 19, Trinity Marsh Lane, Waltham Cross, Herts. British. Chemist. M.Sc.Tech. (Manchester), A.I.C. Employed at Messrs. Allen & Hanbury's, London, as assistant chemist in the analytical and research departments. (*Signed by*) F. W. Gamble, Frank Lee Pyman, John K. Wood.

TRUSZKOWSKI, RICHARD, Koszykowa 21, m. 3, Warsaw, Poland. British. Research Student. B.Sc. (*Signed by*) Stanley A. Mumford, O. L. Brady, E. H. Thierry.

VINEY, HUMPHREY TERENCE, Bramerton, Blakebrook, Kidderminster. British. Carpet Industry, Application of Chemical Science to. Honours B.Sc., Birmingham University. (*Signed by*) G. T. Morgan, S. R. Carter, E. A. Cooper, C. E. Wood.

WALL, THOMAS JOHN, Northcote, Alexandra Road, Malvern. British. Research Student. Took Part I of Final Honour School of Natural Science at Oxford in June last and am now doing research in Organic Chemistry for Part II. Exhibitioner of Christ Church, Oxford. (*Signed by*) S. G. P. Plant, N. V. Sidgwick, E. Hope.

WARD, HARRY, Toynbee Hall, 28, Commercial St., E.1. British. Research Chemist. B.Sc. (Hons.) (Leeds), M.Sc., A.I.C. 2½ years' experience as research chemist with the General Electric Company. (*Signed by*) R. Le Rossignol, L. D. Goldsmith, William Singleton.

WATSON, STEPHEN JOHN, School of Agriculture, Reaseheath Hall, Nantwich, Cheshire. British. Demonstrator in Agricultural Chemistry, Armstrong College (in the University of Durham). Degree of B.Sc. in agriculture, Armstrong College, Durham University. Registered student of the Institute of Chemistry. Research on potash. Paper accepted for publication by the Society of Public Analysts. Eighteen months' experience in coal analysis. Delivered 50 lectures to Elementary Class in Agricultural Chemistry. (*Signed by*) S. Hoare Collins, Philip Buckle, Lionel Orange, Harold Scragg.

WILLIAMS, ALEXANDER MITCHELL, Shirley Institute, Didsbury, Manchester. British. Research Chemist. M.A., D.Sc. Author or joint author of over a dozen scientific papers on physical chemistry (including T., 1920, **117**, p. 844). (*Signed by*) Arthur W. Crossley, D. Clibbens, R. G. Fargher, J. C. Withers.

WOODWARD, ERIC RICHARD BORAMAN, The Vicarage, Herne Bay, Kent. Chemist. Graduate (B.Sc. in Chemistry and Physics) of the University, Liverpool. (*Signed by*) I. M. Heilbron, E. C. C. Baly, Herbert H. Froysell.

WOOLCOCK, WILLIAM JAMES UGLOW, C.B.E., M.P., 166, Piccadilly, W.1. British. General Manager, Association of British Chemical Manufacturers. Pharmaceutical Chemist. Barrister-at-law. (*Signed by*) M. O. Forster, N. Garrod Thomas, E. V. Evans, E. F. Armstrong.

The following Certificate has been authorised by the Council for presentation to ballot under Bye-law I (2):

GOVILA, BABU LALL, Gwalior. Hindu. Principal of Central Polytechnic Institute, and Director of Industrial and Technical Education, Gwalior State. (1) Studied chemistry in Indian University College and Japan. (2) Graduated in Tokyo (Japan) in colour chemistry. (3) Studied weaving and spinning in Japan. (4) Worked as Professor and Demonstrator of applied chemistry. (5) Worked in dyeing, calico printing, and soap works in Japan and India. (6) Worked as Principal of the Institute of Textile Technology, Chanderi. (7) Worked in colour research and coal-tar products. (8) Working as Principal of Central Polytechnic Inst. with a department for applied chemistry, and training students in dyeing, calico printing, soap-making, coal-tar distillation, intermediate products, and coal-tar dyes, for the City and Guilds of London Examinations, for the last four years. (*Signed by*) Puran Singh.

ADDITIONS TO THE LIBRARY.

I. *Presented by the Society of Chemical Industry.*

AGRICULTURAL LEDGER. Calcutta 1892—1912. (*Reference.*)

CHEMICAL ENGINEERING AND THE WORKS CHEMIST. Vols. I—V. Dover 1911—1915. (*Reference.*)

DINGLERS POLYTECHNISCHES JOURNAL. Vols. CCIX—CCLVI. Stuttgart 1876—1885. (*For Circulation.*) [Wanting Vol. CCXXXV.]

INDIA, *Imperial Department of Agriculture.* Agricultural Journal of India. Vols. III—XIV. Calcutta 1908—1919. (*Reference.*) [Wanting Vols. V, VI, VIII, IX. Vols. III, VII, XI, XIII incomplete.]

INDIA RUBBER JOURNAL. Vols. XLIX—LVIII. London 1915—1919. (*Reference.*)

KŌGYŌ-KWAGAKU-KWAI. (Society of Chemical Industry.) Zasshi. (Journal.) Vols. XVIII—XXII. Tokyo 1915—1919. (*Reference.*) [Vols. XVIII, XXI, XXII incomplete.]

PERFUMERY AND ESSENTIAL OIL RECORD. Vols. VI—XI. London 1914—1920. (*Reference.*) [Vols. IX, X incomplete.]

PHILOSOPHICAL MAGAZINE. Vols. XXIX—XL. London 1915—1920. (*For Circulation.*) [Wanting Nos. 193, 233—234, 236.]

REVUE DE METALLURGIE. Vols. XI—XVI. Paris 1914—1919. (*Reference.*) [Vols. XI, XIV, XV incomplete.]

RUSSIAN PHYSICAL and CHEMICAL SOCIETY. Journal. Vols. XXV—XLVIII. St. Petersburg 1893—1916. (*For Circulation.*) [Wanting Vols. XXXV, XXXVI. Vols. XXV, XXVII, XXXII—XXXIV, XXXVII incomplete.]

U.S. DEPARTMENT OF AGRICULTURE. *Office of Experiment Stations.* Experiment Station Record. Vols. XI—XLVIII. Washington 1899—1919. (*Reference.*) [Wanting Vols. XVIII, XXXIII—XXXVI. Vols. XI, XXVI—XXX, XXXVIII, XXXIX, XLI incomplete.]

U.S. DEPARTMENT OF COMMERCE. *Bureau of Standards.* Bulletin. Vols. I—XIV. Washington 1904—1918. (*Reference.*)

Also odd volumes and parts of the following:

Circulars, Scientific and Technologic Papers of the Bureau of Standards. Biochemical Journal. Bulletins and Circulars of the U.S. Bureau of Chemistry.

II. *Miscellaneous Donations.*

ABDERHALDEN, EMIL. Handbuch der biologischen Arbeitsmethoden. Abt. I. Chemische Methoden. Abt. IV. Angewandte chemische und physikalische Methoden. Berlin 1921+.

From the Publishers: Herrn Urban & Schwarzenberg.

FUEL IN SCIENCE AND PRACTICE. A journal of the scientific and economic use of fuels. (Being the Record of the Coal Research Club.) Vol. I, etc. London 1922+. ill. (*Reference.*) [Monthly supplement to The Colliery Guardian.]

From the Publishers: The Colliery Guardian Co., Ltd.

HACKH, INGO W. D. Chemical reactions and their equations. A guide and reference book for students of chemistry. Philadelphia 1922. pp. viii+138. ill. 6*s.* net. (*Recd.* 13/11/22.)

From the London Publishers: Messrs. Chapman & Hall.

MINISTRY OF MUNITIONS and DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH. Technical records of explosives supply. No. 9. Heat transmission. London 1922. pp. iv+48. ill. 5*s.* net. (*Recd.* 1/11/22.) From the Department.

U.S. WAR DEPARTMENT. Report on the fixation and utilization of nitrogen. Washington 1922. pp. xii+354. ill. (*Recd.* 15/7/22.)

From the Chief of Ordnance.

III. *By Purchase.*

ARNAUD, D., and FRANCHE, G. Manuel de céramique industrielle. 2nd edition. Paris 1922. pp. x+642. ill. (*Recd.* 4/9/22.)

ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS. Official and tentative methods of analysis, as compiled by the Committee on

Revision of Methods. 2nd edition, revised to November 1, 1919. Washington, D.C. 1921. pp. xii+418. ill. (*Recd.* 21/8/22.)

BARKER, ALDRED FARRER, [and others]. Textiles. Revised edition. London 1922. pp. xii+386. ill. 15*s.* net. (*Recd.* 16/11/22.)

BINGHAM, EUGENE C. Fluidity and plasticity. New York 1922. pp. xii+440. ill. 20*s.* net. (*Recd.* 16/11/22.)

BOGUE, ROBERT HERMAN. The chemistry and technology of gelatin and glue. New York 1922. pp. xii+644. ill. 30*s.* net. (*Recd.* 16/11/22.)

BOLL, MARCEL, and BENNEJEANT, CHARLES. Chimie des métaux et métallurgie dentaires. Paris 1922. pp. xii+252. ill. (*Recd.* 1/7/22.)

CHEMISCH-TECHNISCHE UNTERSUCHUNGSMETHODEN. 7th edition. Edited by ERNST BERL. Vol. I. etc., Berlin 1921+. ill. (*Reference.*)

DAVIS, ARTHUR CHARLES. Manufacture of Portland cement. 3rd edition. Dublin 1922. pp. xiv+416. ill. 25*s.* net. (*Recd.* 6/7/22.)

DAY, DAVID T., and others. A handbook of the petroleum industry. 2 vols. New York 1922. pp. x+964, vi+1006. ill. 75*s.* net. (*Recd.* 16/11/22.)

EINSTEIN, ALBERT. Untersuchungen über die Theorie der "Brownschen Bewegung." Edited by R. FÜRTH. (Ostwald's *Klassiker*, No. 199.) Leipzig 1922. pp. 72. ill. (*Recd.* 14/9/22.)

EPHRAIM, FRITZ. Anorganische Chemie: ein Lehrbuch zum Weiterstudium und zum Handgebrauch. Dresden 1922. pp. viii+727. (*Recd.* 3/10/22.)

FISCHER, EMIL. Untersuchungen über Kohlenhydrate und Fermente. II. (1908—1919.) Berlin 1922. pp. x+534. (*Recd.* 14/9/22.)

GILDEMEISTER, EDUARD, and HOFFMANN, FRIEDRICH. The volatile oils. 2nd edition, translated by EDWARD KREMERS. Vol. III. London 1922. pp. xx+778. ill. 32*s.* net. (*Recd.* 6/11/22.)

HAAS, PAUL, and HILL, THOMAS GEORGE. An introduction to the chemistry of plant products. Vol. II. London 1922. pp. viii+140. ill. 7*s.* 6*d.* net. (*Recd.* 10/10/22.)

HOFMAN, HEINRICH OSCAR. Metallurgy of zinc and cadmium. New York 1922. pp. xii+342. ill. 20*s.* net. (*Recd.* 20/6/22.)

INSTITUTION OF PETROLEUM TECHNOLOGISTS. The petroleum industry. A brief survey of the technology of petroleum. London [1922]. pp. viii+346. ill. 14*s.* net. (*Recd.* 6/7/22.)

KAYSER, EDMOND. Microbiologie appliquée à la fertilisation du sol. 4th edition. Paris 1921. pp. 325. ill. (*Recd.* 1/7/22.)

—— Microbiologie appliquée à la transformation des produits agricoles. 4th edition. Paris 1921. pp. 390. ill. (*Recd.* 1/7/22.)

MEYER, RICHARD. Victor Meyer: Leben und Wirken eines deutschen Chemikers und Naturforschers 1848—1917. Leipzig 1917. pp. xvi+472. ill. (*Recd.* 21/8/22.)

—— Vorlesungen über die Geschichte der Chemie. Leipzig 1922. pp. viii+468. (*Recd.* 10/10/22.)

ROBERTSON, GEORGE SCOTT. Basic slags and rock phosphates. Cambridge 1922. pp. xvi+120. ill. 14*s.* net. (*Recd.* 20/6/22.)

ROBINSON, CLARK SHOVE. The elements of fractional distillation. New York 1922. pp. x+206. ill. 12*s.* 6*d.* net. (*Recd.* 21/6/22.)

ROGERS, ALLEN. Practical tanning: a handbook of modern practice and processes as applied in the manufacture of leather and allied products. London 1922. pp. xxvi+700. ill. 45*s.* net. (*Recd.* 6/7/22.)

RYDBERG, JOHANNES ROBERT. Untersuchungen über die Beschaffenheit der Emissionsspektren der chemischen Elemente. Translated from the French by A. VON OETTINGEN. Edited by MANNE SIEGBAHN and A. VON OETTINGEN. (Ostwald's *Klassiker*, No. 196.) Leipzig 1922. pp. xvi+214. ill. (*Recd.* 14/9/22.)

SCOTT, WILFRID W. [Editor.] Standard methods of chemical analysis: a manual of analytical methods and general reference. 3rd edition. 2 vols. New York 1922. pp. xxviii+726, xviii, 1001–1570+50. ill. 52*s.* 6*d.* net. (*Recd.* 16/11/22.)

TAMMANN, GUSTAV. Aggregatzustände: die Zustandsänderungen der Materie in Abhängigkeit von Druck und Temperatur. Leipzig 1922. pp. viii+294. ill. (*Recd.* 27/6/22.)

IV. *Pamphlets.*

AIR MINISTRY. *Meteorological Office.* Advisory Committee on Atmospheric Pollution. Report on observations in the year ending March 31st, 1921. Forming the seventh report of the Committee for the Investigation of Atmospheric Pollution. London 1922. pp. 31. ill.

ALBERTA. *Scientific and Research Council.* Second annual report. Edmonton 1922. pp. 86. ill.

AMERICAN INSTITUTE OF BAKING. Bulletin No. 8. The diastatic enzymes of wheat flour and their relation to flour strength. By LOUYS A. RUMSEY. 1922. pp. 86. ill.

—— Bulletin No. 9. Flour strength as influenced by the addition of diastatic ferments. By FERDINAND A. COLLATZ. 1922. pp. 74. ill.

BELAIEW, NICHOLAS TIMOTHY. Heat treatment of steel. (From the *Russian Economist*, 1922, 2.)

—— Henry Marion Howe (1848—1922). (From the *Russian Economist*, 1922, 2.) ill.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, December 7th, 1922, at 8 p.m., Professor SAMUEL SMILES, O.B.E., D.Sc., F.R.S., Vice-President, in the Chair.

The CHAIRMAN referred to the loss sustained by the Society, through death, of:

	Elected.	Died.
Thomas William Dukes	Dec. 5th, 1889.	Nov. 8th, 1921.
David Thomas Williams	Feb. 20th, 1908.	Jan. 29th, 1922.

Mr. G. F. Underhay was formally admitted a Fellow of the Chemical Society.

Certificates were read for the first time in favour of:

Arthur John Attwood, A.R.C.S., 11, Frederick Crescent, S.W. 9.
Frederick Bradshaw, M.A., D.Sc., 78, Rothbury Terrace, Heaton, Newcastle-on-Tyne.
Charles Crossley Mann Broughton, B.Sc., 2, Upton Road, Bexleyheath.
John Southwell Bousfield, A.R.C.S., 2, Lyndale, Childs Hill, N.W. 2.
Leslie John Couzens, 101, Kensington Avenue, Manor Park, E. 12.
Ernest Cecil Craven, 59, Southern Road, Plaistow, E. 13.
James Cooper Duff, M.Sc., F.I.C., 13, Queen's Road, Erdington, Birmingham.
John Kenneth Giles, B.Sc., Hillcrest, Arkley, Barnet.
John Preedy Griffiths, B.Sc., A.R.C.S., 15, Hazelwood Lane, Palmer's Green, N. 13.
Leslie Julius Harris, B.Sc., 18, The Park, Ealing, W. 5.
John Laker, B.Sc., 8, Allerton Road, N. 16.
George Arnold Medley, 45, Hill Top Road, Dalton, Huddersfield.
William James Osborn, 12, West Square, Southwark, S.E. 1.
Francis James Paxon, B.Sc., A.R.C.S., 30, St. George's Road, Palmer's Green, N.13.
Edwin William Stanley Press, 4, Porchester Square, Hyde Park, W. 2.
Edward Ebenezer Price, The Haven, Dormans Park, East Grinstead.
Edgar Sanders, The White House, Blackwell, Worcestershire.
Hedley Archibald Sloman, B.A., A.I.C., Robinhood, Undercliff Gardens, Leigh-on-Sea, Essex.
Arthur Roy Stark, 76, De la Pole Avenue, Hull.
Frederick Vincent Tideswell, M.Sc., Dept. of Fuel Technology, The University, Sheffield.

Frederic Jenner Tritton, B.Sc., 1F, Vicarage Mansions, West Green, N. 15.
Paule Laure Vanderstichele, M.Sc., Bedford College for Women, Regent's Park, N.W. 1.
Stanley Douglas Weaver, B.Sc., A.R.C.S., 27, Hastings Road, Maidstone.
Harold Wood, B.Sc., 39, Edmund Street, Seedley, Manchester.

The CHAIRMAN announced that a circular had been sent out to Fellows with regard to the new weekly Journal entitled "Chemistry and Industry," and that the Journal for 1923 would be supplied to Fellows for the sum of 10*s*.

Mr. C. S. Grace and Dr. G. A. R. Kon were elected Scrutators, and a ballot for the election of Fellows was held. The following were subsequently declared elected as Fellows:

Robert Allanson.
Thomas Cuthbert Allchin.
James Wilson Armit, M.A.
Leopold Louis Bacarese.
Leslie Bains, B.A., B.Sc., A.I.C.
Menghraj Choithram Bathija, B.A.
Nicholas Timothy Belaiew, C.B.
James Bell.
Donald Charles Broome.
Walter Ferguson Buist, B.Sc.
Stanley Robert Bult.
Arthur Josiah Burford.
George Joseph Burrows, B.Sc.
William Leslie Carter.
Sydney George Cavigan.
John Hardwick Long Champion, B.Sc.
Katragadda Seshachalam Choudary, M.A., M.Sc.
Elliot Martin Christie, M.Sc.
Frederick Stanley Clarke.
Allin Cottrell.
John Arnold Cranston, D.Sc.
Hugh John Curnow.
Edward Dance, B.Sc.
Wilfred Thomas Grey Davies, B.Sc.
Milton Dewhurst, B.Sc., A.I.C.
Richard Victor Eaton, B.Sc., A.R.C.S.
Norman Evers, B.Sc., F.I.C.
Joshua William Farmery, M.A., A.I.C.
Samuel Frederick Ford.
Roy Gardner, B.Sc.
Philip Henry Gifford, B.Sc.
Babu Lall Govila.
Roland Hall Griffith, B.A.
Reginald William Griffiths, B.Sc.
John Masson Gulland, B.Sc.
Herbert Haigh, B.Sc.
Lucy Higginbotham, M.Sc.
Thomas Edward Hubbard.
James Ernest Humphries, B.A., M.Sc.
John Huntley.
Sydney Alfred Hurren, M.C.
Habib Iskander.
John Watson Jenkin, B.Sc., A.I.C.
John Ernest Jewell.
Edgar Jones.
Jan Kalff, D.Chem.
Shankar Nath Kapur, B.Sc.
Ghulam Safdar Khan, B.Sc.
Svend Hald Lassen.
William Dawson Lloyd.
Philip Patrick Lynch, B.Sc.
Francis Geoffrey Macalpine, B.Sc.
Frederick Henry McDowall, M.Sc.
Kenneth McKenzie.
Reginald Arthur McNicol, M.Sc.
Thomas Malkin, B.Sc., A.I.C.
Archibald Roy Hammond Martin, B.A.
Joseph Keith Matthews, M.A.
Charles William Moorhead.
John Ewart Moss, M.Sc.
Dina Nath.
Torkild Haastrup Nielsen, B.Sc.
Hidejiro Nishikawa.
Hiroshi Nomura.
Albert Bramah Pearce Page, A.R.C.S.
Harold Pickles.
Joseph Edwards Pooley.
Thomas Trevor Potts.
James Robert Pound, M.Sc.
Nagendra Prasad, M.Sc.
Edmund Brydges Rudhall Prideaux, M.A., D.Sc., F.I.C.

Alfred Norman Douglas Pullen.
George Clifford Riley, B.A., B.Sc.
Thomas Abraham Robertson.
Burke Rushworth.
Arthur Scholefield.
Gopal Singh, M.Sc.
George Victor Smith, A.R.C.S.
Stanley James Corrall Snedker.
Oscar Walter Snow, B.A.
Francis Wilbert Stoyle, M.Sc.
Leslie Stuart Theobald, A.R.C.S.
William Thompson, B.Sc.
Laurence Barnett Timmis, M.Sc.Tech., A.I.C.
Richard Truszkowski, B.Sc.
Humphrey Terence Viney, B.Sc.
Thomas John Wall, B.A.
Harry Ward, M.Sc., A.I.C.
Stephen John Watson, B.Sc.
Alexander Mitchell Williams, M.A., D.Sc.
Eric Richard Boraman Woodward, B.Sc.
William James Uglow Woolcock, C.B.E.

The following papers were read:

"The isoelectric condition of gelatin." By S. O. RAWLING and W. CLARK.

"Studies on metal hydrides. The electrolytic formation of stibine in sulphuric acid and caustic soda solution." By H. J. S. SAND, E. J. WEEKS, and S. W. WORRELL.

"Three carbon tautomerism in the *cyclo*propane series." By F. R. GOSS, C. K. INGOLD, and J. F. THORPE.

Meeting held in the Lecture Hall of the Institution of Mechanical Engineers, on Thursday, December 14th, 1922, at 8 p.m., Professor H. B. DIXON, C.B.E., M.A., F.R.S., Vice-President, in the Chair.

Professor C. H. Desch, D.Sc., Ph.D., delivered his Lecture entitled: "The metallurgical applications of physical chemistry." A vote of thanks to the Lecturer, proposed by Professor T. M. Lowry and seconded by Dr. N. V. Sidgwick, was carried with acclamation, acknowledgment being made by Professor Desch.

Ordinary Scientific Meeting, Thursday, December 21st, 1922, at 8 p.m., SIR JAMES WALKER, D.Sc., F.R.S., President, in the Chair.

The President referred to the loss sustained by the Society, through death, of:

	Elected.	Died.
Henry Ruchet Fairweather	Dec. 4th, 1919.	Sept. 11th.

Messrs. Duncan P. Woosley and Donald C. Broome were formally admitted Fellows of the Chemical Society.

Certificates were read for the first time in favour of:

George James Alexander, B.Sc., 1, Terrace Road, Upton Manor, E. 13.
Harold Eugene Buckley, M.Sc., 273, Wigan Road, Bolton.
Robert Kenneth Callow, B.A., B.Sc., 17, Sutherland Street, S.W. 1.
Alexander Coutie, 4, Priestfield Road, Edinburgh.

Thomas Arthur Harrison, 64, Eastwood Road, Goodmayes.
Herbert Frederick Miller, B.Sc., A.I.C., Griffith John College, Hankow, China.
William Owen Murch, B.Sc., National Institute for Medical Research, Hampstead, N.W. 3.
James Herbert Oliver, B.Sc., 22, Avenue Gardens, Acton, W. 3.
Thomas Workman Orr, A.I.C., Antofagasta, Chile.
Edward Arthur Perren, 70, Denton Road, N. 8.
Frank Victor Raleigh, B.A., B.Sc., 6, Cavendish Road, Harringay, N. 4.
Helena Charlotte Randall, B.Sc., A.R.C.S., 57, Farnham Road, Guildford.
Jerry Robertson, 38, Church Street, Heckmondwike.
Douglas Rosebery Snellgrove, B.Sc., 73, Millbrook Road, Southampton.
Montague Williams, B.Sc., Cleveland Cottage, The Grove, Isleworth.

Certificates have been authorised by the Council for presentation to ballot under Bye-Law I (2) in favour of:

Donald Hatch Andrews, B.A., Stirling Chemical Laboratory, New Haven, Conn., U.S.A.
Arthur D. Little, Charles River Road, Cambridge, Mass., U.S.A.

The following papers were read:

"Benzbisthiazoles. Part II." By S. R. H. Edge.
"Ring-chain tautomerism. Part IV. The effect of the methyl ethyl grouping on the carbon tetrahedral angle." By B. Singh and J. F. Thorpe.

ORDINARY SCIENTIFIC MEETING.

The next Ordinary Scientific Meeting will be held on Thursday, January 18th, 1923, at 8 p.m.

BUREAU FOR PHYSICO-CHEMICAL STANDARDS.

Under the auspices of the Union Internationale de la Chimie Pure et Appliqué, a "Bureau des Etalons Physico-chimiques" has been established at Brussels (Université, rue des Sols). This is intended as a centre for the preparation and collection of substances of the highest purity, the physical constants of which have been determined with the utmost possible precision, and which shall be at the disposal of research workers. An appeal is accordingly made to chemists generally to collaborate in the provision of highly purified products from which the standards may be prepared.

It is further proposed to collect the scattered literature dealing with the preparation of substances in a condition of the highest purity, and with the determination of their physical constants. With this object in view, investigators are invited to furnish the Bureau with copies of any relevant papers.

List of Papers received between November 17th, 1922, and December 21st, 1922:

"Negative hydrogen and the electronic formula of benzene." By H. S. Fry.

"Elimination of the amino-group of tertiary amino-alcohols. Part I." By A. McKenzie and A. C. Richardson.

"Studies on metal hydrides. The electrolytic formation of stibine in sulphuric acid and caustic soda solution." By H. J. S. Sand, E. J. Weeks, and S. W. Worrell.

"Some derivatives of methylene-diquinalide and their relationship to the carbocyanines." By F. M. Hamer.

"Dyestuffs derived from heterocyclic bases containing reactive methyl groups." By J. L. B. Smith.

"1 : 8-*bis*-Naphthylene-indigo." By S. Dutt.

"Dyes derived from diphenic anhydride." By S. Dutt.

"The effect of metallic oxides and metals on the oxidation of vegetable oils in presence of fibrous material. Part I. The rise in temperature and the changes in iodine value." By M. B. Rāne, P. N. Roy, and L. Gupta.

"Synthesis of substituted thianthrens. Part I. Thianthren and nitrothianthren." By S. Krishna.

"The absorption of moisture by coal (and other fuels). Part I. A relation between degree of humidity in the air and moisture content of coal." By B. Moore and F. S. Sinnatt.

"The nitration of benzaldehyde." By O. L. Brady and S. Harris.

"The investigation of *meso*-thioanthracene derivatives. Part I. Observations on the production of dithioanthraquinone, dithiodianthrone, and other closely related derivatives." By I. M. Heilbron and J. S. Heaton.

"The chemistry of the glutaconic acids. Part XIII. The isomerism due to retarded mobility." By J. F. Thorpe and A. S. Wood.

"The chemistry of the glutaconic acids. Part XIV. Three carbon tautomerism in the *cyclo*propane series." By F. R. Goss, C. K. Ingold, and J. F. Thorpe.

"The quantitative absorption of light by simple inorganic salts. Part II. The chlorides of arsenic, antimony, and bismuth." By A. K. Macbeth and N. I. Maxwell.

"The production and reactions of 2-dithiobenzoyl." By M. McKibben and E. W. McClelland.

"The influence of papaverine on the optical activity of narcotine in acid solution." By H. E. Annett.

"The higher oxide of cobalt." By O. R. Howell.

"The calculation of the colour of monocyclic substances by assigning an absorption band to each possible tautomeric formula of the substance." By J. Moir.

"The application of the Hoesch reaction to the preparation of some dihydroxy- and trihydroxy-deoxybenzoins." By E. Chapman and H. Stephen.

"Studies on thallium compounds. Part II. The reduction of thallic compounds with ferrous sulphate and with sodium arsenite." By A. J. Berry.

"The constitution of the disaccharides. Part VII. Sucrose." By W. N. Haworth and W. H. Linnell.

"The determination of the dissociation pressures of hydrated salts by a dynamical method. Part II." By J. R. Partington and D. B. Huntingford.

"The constitution of the disaccharides. Part VIII. Sucrose." By W. N. Haworth and J. G. Mitchell.

"Benzbisthiazoles. Part II." By S. R. H. Edge.

"The upper limit of diazotisability in the benzene series. Diazo-derivatives of mesitylene." By G. T. Morgan and G. R. Davies.

"Researches on residual affinity and co-ordination. Part XV. Interactions of acetylpropionylmethane and the tetrachlorides of selenium and tellurium." By G. T. Morgan and H. G. Reeves.

"Studies in the normal butyl series. Part II. The four stereoisomeric β-γ-di-*p*-tolylamino-*n*-butanes." By G. T. Morgan and W. J. Hickinbottom.

"The formation and stability of spiro-compounds. Part X. Spiro-compounds derived from *cyclo*heptane." By J. W. Baker and C. K. Ingold.

"The sorption by carbon prepared from pure organic compounds. Part I. The sorption of iodine by carbons prepared from carbohydrates." By J. B. Firth.

"Ring-chain tautomerism. Part IV. The effect of the methyl ethyl grouping on the carbon tetrahedral angle." By B. Singh and J. F. Thorpe.

"The transition from the colloidal to the crystalloidal state. Part I. Solutions of potassium oleate." By L. L. Bircumshaw.

"Investigations on the dependence of rotatory power on chemical constitution. Part XVIII. The di-*l*-menthyl esters of the acids of the oxalic esters." By L. Hall.

"The propagation of flame in complex gaseous mixtures. Part V. The interpretation of the law of speeds." By W. PAYMAN.

"The rate of detonation in complex gaseous mixtures." By W. PAYMAN and N. S. WALLS.

"Determination of tin in wolfram. A modification of Powell's method." By O. F. LUBATTI.

"The reactivity of doubly-conjugated unsaturated ketones. Part IV. The effect of substitution on the reactivity of 4′-dimethylamino-2-hydroxydistyryl ketone." By I. M. HEILBRON and A. B. WHITWORTH.

"Studies in phototropy. The reversed phototropy of cinnamaldehydesemicarbazone and its methoxy derivatives." By I. M. HEILBRON, H. E. HUDSON, and D. M. HUISH.

"Complex metallic ammines. Part VIII. The introduction of *d*- and *tri*-basic organic acid radicles into the pentamminecobaltic complex." By J. C. DUFF.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

DAKIN, HENRY DRYSDALE. Oxidations and reductions in the animal body. 2nd edition. London 1922. pp. x + 176. 6*s*. net. (*Recd.* 1/12/22.)

From the Publishers: Messrs. Longmans, Green & Co.

HACKSPILL, LOUIS. L'azote: la fixation de l'azote atmosphérique et son avenir industriel. Paris 1922. pp. xii + 272. ill. 14 *fr*. net. (*Recd.* 8/12/22.) From Dr. E. B. Maxted.

KEMPTON, PERCIVAL HENRY SYDNEY. The industrial applications of X-rays: an introduction to the apparatus and methods used in the production and application of X-rays for the examination of materials and structures. London 1922. pp. xiv + 112. ill. 2*s*. 6*d*. net. (*Recd.* 6/12/22.)

From the Publishers: Sir Isaac Pitman & Sons.

II. *By Purchase.*

BACON, RAYMOND FOSS, and HAMOR, WILLIAM ALLEN. [Editors.] American fuels. 2 vols. New York 1922. pp. x + 628, vi, 629—1258. ill. 60*s*. net. (*Recd.* 23/11/22.)

BARKER, ALDRED FARRER, and MIDGLEY, EBER. Analysis of woven fabrics. 2nd edition. London 1922. pp. xvi + 322. ill. 15*s*. net. (*Recd.* 16/11/22.)

CLARK, WILLIAM MANSFIELD. The determination of hydrogen ions. 2nd edition. Baltimore 1922. pp. 480. ill. $5 net. (*Recd.* 9/12/22.)

CLARKE, ALBERT. Coal-tar colours in the decorative industries. London 1922. pp. xiv + 166. 6*s*. net. (*Recd.* 21/11/22.)

DESCOUR, L. Pasteur and his work. Translated by A. F. WEDD and B. H. WEDD. London [1922]. pp. 256. ill. 15*s*. net. (*Recd.* 21/11/22.)

GRAFE, VIKTOR. Chemie der Pflanzenzelle. Berlin 1922. pp. viii + 421. ill. (*Recd.* 28/11/22.)

HÖBER, RUDOLF. Physikalische Chemie der Zelle und der Gewerbe. 5th edition. [Part I.] Leipzig 1922. pp. xvi + 544. ill. (*Recd.* 1/12/22.)

KEWLEY, JAMES. The petroleum and allied industries: petroleum, natural gas, natural waxes, asphalts and allied substances, and shale oils. London 1922. pp. xii + 302. ill. 12*s*. 6*d*. net. (*Recd.* 21/11/22.)

MARSHALL, CHARLES EDWARD. [Editor.] Microbiology: a text-book of microörganisms general and applied. [Philadelphia 1921.] pp. xxviii + 1044. ill. 21*s*. net. (*Recd.* 28/11/22.)

MICHAELIS, LEONOR. Die Wasserstoffionenkonzentration: ihre Bedeutung für die Biologie und die Methoden ihrer Messung. 2nd edition. Part I. Berlin 1922. pp. xii + 262. ill. (*Recd.* 1/12/22.)

PARRY, ERNEST JOHN. The chemistry of essential oils and artificial perfumes. 4th edition. 2 vols. London 1921—22. pp. viii + 549, viii + 365. ill. 51*s*. net. (*Recd.* 23/11/22.)

PILE, SEYMOUR, and JOHNSTON, REGINALD. Tested methods of metallurgical analysis (non-ferrous). London 1922. pp. 128. ill. 7*s*. 6*d*. net. (*Recd.* 21/11/22.)

RUSSELL, ALEXANDER SMITH. An introduction to the chemistry of radio-active substances. London 1922. pp. xii + 174. ill. 6*s*. net. (*Recd.* 21/11/22.)

SOCIETY OF DYERS AND COLOURISTS. Colour index. Part I, etc. Bradford 1922 +. (*Reference.*)

SMITS, ANDREAS. The theory of allotropy. Translated by JOHN SMEATH THOMAS. London 1922. pp. xiv + 398. ill. 21*s*. net. (*Recd.* 9/12/22.)

SOMMERFELD, ARNOLD. Atombau und Spektrallinien. 3rd edition. Braunschweig 1922. pp. xii + 764. ill. (*Recd.* 29/11/22.)

VENERAND, WOLFGANG. Asbest und Feuerschutz: Vorkommen, Verarbeitung und Anwendung des Asbestes. Feuerschutz in Theatern, öffentlichen Gebäuden usw. 2nd edition. Wien 1920. pp. viii + 360. ill. (*Recd.* 8/12/22.)

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, January 18th, 1923, at 8 p.m., SIR JAMES WALKER, D.Sc., F.R.S., President, in the Chair.

The President referred to the loss sustained by the Society, through death, of the following Fellows :

	Elected.	Died.
Georg Lunge (Honorary Fellow)	March 4th, 1909.	Jan. 3rd, 1923.
Alfred Edward Carey	Feb. 16th, 1888.	Dec. 30th, 1922.
Robert George Grimwood	May 4th, 1893.	Dec. 24th, 1922.
William Alfred Squance	Feb. 17th, 1921.	Dec. 9th, 1922.
John Robert Tustin	Feb. 2nd, 1871.	Dec. 24th, 1922.
Frank Edwin Weston	June 16th, 1898.	Jan. 4th, 1923.

The PRESIDENT announced :

That the following vacant places fall due to be filled at the Annual General Meeting on March 22nd, 1923, in accordance with the Bye-Laws :

President	One vacancy.
Vice-Presidents who have filled the office of President	Two vacancies.
Vice-Presidents who have not filled the office of President	Three vacancies.
Treasurer	One vacancy.

Ordinary Members of Council :

(*a*) Town Members (*i.e.* those living within a radius of 50 miles from London) ...	Three vacancies.
(*b*) Country Members (*i.e.* those living beyond a radius of 50 miles from London) ...	Three vacancies.

The Council has nominated Prof. W. P. Wynne to the office of President.

It has also nominated Prof. J. F. Thorpe to the office of Treasurer.

The names of the Members of Council who retire at the Annual General Meeting on the 22nd March, 1923, and who are ineligible for re-election to the same office until the lapse of one year, are as follows :

President :

Sir James Walker.

Vice-Presidents who have filled the office of President :

Prof. H. E. Armstrong, Prof. W. H. Perkin.

Vice-Presidents who have not filled the office of President :

Prof. F. S. Kipping, Prof. S. Smiles.

Ordinary Members of Council :

(*a*) Town Members :

Prof. A. J. Allmand, Mr. F. H. Carr, Prof. J. M. Thomson.

(*b*) Country Members :

Prof. T. S. Patterson, Mr. W. Rintoul, Prof. R. Robinson.

Messrs. L. Bains, J. W. Farmery, and C. A. Silberrad were formally admitted Fellows of the Chemical Society.

Certificates were read for the first time in favour of :

William Bennett Adam, B.A., Belcaro, Enfield, Middlesex.
Alfred Berthoud, The University, Neuchâtel, Switzerland.
Ernest Alfred Blench, 74, Squires Lane, Finchley, N.3.
Joseph Cofman-Nicoresti, 16, Crediton Hill, N.W.6.
Augustine Malcolm Manhkram David, B.Sc., Murray College, Sialkote, India.
John Norman Dean, B.Sc., A.I.C., Goodbury, Kemsing, Sevenoaks.
Albert Edward Gray, 23, Gauden Road, Clapham, S.W.4.
Laurence Horton, B.Sc., A.R.C.S., 45, Steade Road, Sheffield.
Joseph Kenneth Marsh, M.Sc., 28, Lansdowne Road, Belfast.
Dhirendra Nath Mukerji, M.Sc., 1, Gobinda Bose Lane, Bhowanipore, Calcutta.
George Alan Redfern, B.A., 44, Talbot Road, Highgate, N. 6.
Andreas Smits, The University, Nieuwe Prinsengracht 126, Amsterdam.
John Smeath Thomas, D.Sc., 179, Kingsley Road, Liverpool.
John Thompson, 20, Marchmont Road, Edinburgh.
Hubert William Thorp, B.Sc., 92, Queen's Road, Dalston, E. 8.

A Certificate has been authorised by the Council for presentation to ballot under Bye-Law I (2) in favour of :

Clinton N. Laird, M.A., Canton Christian College, Canton, China.

The following papers were read :

"The estimation of acetone in methyl alcohol and the purification of methyl alcohol by sodium hypoiodite." By H. H. Bates, L. M. Mullaly, and H. B. Hartley.

"Rhythmic crystallisation." By W. E. Garner and F. C. Randall.

"The densities of dilute solutions of potassium salts and the volume changes occurring on solution." By H. B. HARTLEY and W. H. BARRETT.

"The chemistry of the glutaconic acids. Part XIV. Three-carbon tautomerism in the *cyclo*propane series. (Addendum)." By F. R. GOSS, C. K. INGOLD, and J. F. THORPE.

LECTURE.

On Thursday, February 22nd, 1923, at 8 p.m., in the Lecture Hall of the Institution of Mechanical Engineers, Storey's Gate, S.W.1., Principal J. C. Irvine, C.B.E., F.R.S., will deliver his Lecture entitled "Some Constitutional Problems of Carbohydrate Chemistry."

THE PATERNÒ MEDAL.

A Committee has been formed at Rome to celebrate the 75th birthday of Professor Emanuele Paternò, the well-known Italian Chemist, who is one of the Honorary Fellows of this Society. It is proposed to institute a Paternò Medal to be awarded annually to the chemist in Italy or elsewhere who makes the most important discovery of the year. Subscriptions towards the institution of this medal will be welcomed, and any British contributions can be forwarded through the Treasurer of the Chemical Society.

List of Papers received between December 22nd, 1922, and January 18th, 1923:

"The estimation of acetone in methyl alcohol and the purification of methyl alcohol by sodium hypoiodite." By H. H. BATES, L. M. MULLALY, and H. B. HARTLEY.

"Derivatives of semioxamazide. Part I. Ketonic semioxamazones." By F. J. WILSON and E. C. PICKERING.

"The constitution of catechin. Part V. The conversion of acacatechin tetramethyl ether into the tetramethyl ether of high-melting catechin." By M. NIERENSTEIN.

"On interfacial tensions." By J. R. POUND.

"Studies in the anthracene series. Part IV." By E. DE B. BARNETT and M. A. MATTHEWS.

"The formation of quaternary ammonium salts. Part I." By E. DE B. BARNETT, J. W. COOK, and E. P. DRISCOLL.

"Action of sulphur monochloride on mercaptans." By G. C. CHAKRAVARTI.

"The electromotive behaviour of magnesium." By A. SMITS.

"Determination of the *iso*electric point of gelatin. A criticism of Patten and Kellem's method." By T. S. PRICE.

"Note on the supposed enantiotropy of lead monoxide." By S. GLASSTONE.

"Researches on *pseudo*-bases. Part IV. A new synthesis of tertiary amines of the form $R{\cdot}CH_2{\cdot}NR^1R^2$." By G. M. ROBINSON and R. ROBINSON.

"An electrolytic method for the preparation of mercury dimethyl." By J. L. MAYNARD and H. C. HOWARD.

"The constituents of Indian turpentine from *Pinus longifolia*, Rox. Part II." By J. L. SIMONSEN and M. G. RAU.

"Rhythmic crystallisation." By W. E. GARNER and F. C. RANDALL.

"The isotope ratio of a sample of chlorine of volcanic origin." By A. D. MONRO.

"The densities of dilute solutions of potassium salts and the volume changes occurring on solution." By H. B. HARTLEY and W. H. BARRETT.

"The system chromium trioxide–nitric acid–water." By S. A. MUMFORD and L. F. GILBERT.

"A new sesquiterpene and other substances in the essential oil of Manuka (*Leptospermum scoparium*)." By R. GARDNER.

"Some factors governing the complete sorption of iodine by carbon from solution." By J. B. FIRTH and F. S. WATSON.

"The chemistry of the glutaconic acids. Part XIV. Three-carbon tautomerism in the *cyclo*propane series. (Addendum)." By F. R. GOSS, C. K. INGOLD, and J. F. THORPE.

"Rotatory dispersion of the esters of lactic acid. Part I. Normal esters." By C. E. WOOD, J. E. SUCH, and F. SCARF.

"Studies in the chroman series. Part II." By H. F. DEAN, A. I. M. KAHIL, and M. NIERENSTEIN.

"The constitution of catechin. Part VI." By H. F. DEAN and M. NIERENSTEIN.

"Preparation of hydrazine by the Raschig reaction." By R. A. JOYNER.

"The configuration of the doubly linked tervalent nitrogen atom. The resolution of the pyridylhydrazone of *cyclo*hexenedithiocarbonate." By W. H. MILLS and H. SCHINDLER.

"Perhalides of quaternary ammonium salts." By F. D. CHATTAWAY and G. HOYLE.

"The tautomerism of amidines. Part I. 2 : 4- and 2 : 5-Diphenylglyoxalines." By R. BURTLES and F. L. PYMAN.

"The tautomerism of amidines. Part II. The alkylation of open-chain amidines." By F. L. PYMAN.

CERTIFICATES OF CANDIDATES FOR ELECTION AT THE BALLOT TO BE HELD AT THE ORDINARY SCIENTIFIC MEETING ON THURSDAY, FEBRUARY 15TH, 1923.

N.B.—The names of those who sign from "General Knowledge" are printed in *italics*.

ADAM, WILLIAM BENNETT, "Belcaro," Enfield, Middlesex. Scottish. On technical staff of Messrs. J. S. Fry & Sons, Ltd., Bristol, and engaged on chemical research at Bristol University. B.A. (Cantab.), Natural Sciences Tripos, Parts I and II (Chemistry). (*Signed by*) W. H. Mills, Eric K. Rideal, Charles T. Heycock.

ALEXANDER, GEORGE JAMES, 1, Terrace Road, Upton Manor, London, E.13. British. Chemical Student. B.Sc. (London), Honours Chemistry. (*Signed by*) J. R. Partington, W. H. Patterson, Frank W. Bury.

ATTWOOD, ARTHUR JOHN, 11, Frederick Crescent, S.W.9. British. Student (Royal College of Science). Present position, Associate of, and Research Student at, the Royal College of Science, London, in the department of Chemistry. (*Signed by*) James C. Philip, C. K. Ingold, H. L. Howard.

BAILEY, KENNETH CLAUDE, 137, South Circular Road, Dublin. British. Lecturer in Exptl. Science, Trinity College, Dublin. B.A. (Hons.) in Exptl. Science, and M.A. (T.C.D.). Paper on "La Synthèse Directe de l'Urée à partir de l'Ammoniaque et du Gaz Carbonique" in the "Comptes Rendus de l'Académie des Sciences," July, 1922. (*Signed by*) Sydney Young, Emil A. Werner, A. G. G. Leonard.

BERTHOUD, ALFRED, Neuchâtel, Suisse. Suisse. Professeur de Chimie physique à l'Université de Neuchâtel. Principaux travaux originaux, concernent la thermo dynamique dans ses applications aux vitenes des reactions chimiques, et les propriétés des fluides. Ouvrages: La Constitution des atomes; Les Nouvelles conceptions de la Matière et de l'atome. (*Signed by*) William J. Pope, T. Martin Lowry, Henry E. Armstrong.

BLENCH, ERNEST ALFRED, 74, Squires Lane, Finchley, N.3. English. Chemistry Student desiring to become Research Chemist. Engaged in Research on Carbon–Oxygen Adsorption. Have held position of Junior Analyst at Borax Consolidated, Ltd., and British Drug Houses, Ltd. (*Signed by*) J. N. Collie, F. G. Donnan, W. E. Garner.

BOUSFIELD, JOHN SOUTHWELL, 2, Lyndale, Child's Hill, London, N.W.2. Schoolmaster. A.R.C.S. Chemistry, 1921, 2nd Class. Served in army 1914–1919. Teaching 1922– (Rugby school, Jan.–Aug., 1922). (*Signed by*) H. B. Baker, James C. Philip, H. F. Harwood.

BRADSHAW, FREDERICK, 78, Rothbury Terrace, Heaton, Newcastle-on-Tyne. British. Librarian and University Lecturer. M.A. (Oxford), D.Sc. (London). I desire to consult and keep abreast of recent chemical literature. (*Signed by*) W. N. Haworth, J. A. Smythe, H. V. A. Briscoe.

BROUGHTON, CHARLES CROSSLEY MANN, 2, Upton Road, Bexley Heath, Kent. British. Research student at Royal College of Science, S.W.7. B.Sc. Hons., Lond. (*Signed by*) Jocelyn Thorpe, C. K. Ingold, M. A. Whiteley.

BUCKLEY, HAROLD EUGENE, 273, Wigan Road, Bolton. British. Assistant Lecturer in Crystallography at Manchester University. B.Sc. (2nd Class

Hons., 1921). Research on "Adsorption" for 12 months, 1921–1922, with Dr. Burt and Mr. Bangham. Dec. 1922, M.Sc. From Sept. 29th, 1922, Assistant Lecturer in Crystallography. (*Signed by*) Henry A. Miers, Arthur Lapworth, H. B. Dixon.

CALLOW, ROBERT KENNETH, 17, Sutherland Street, London, S.W.1. British. Student. Exhibitioner of Christ Church, Oxford. B.Sc. (1st Class Hons. Chemistry), University of London, 1922. Part I, Final Honour School of Natural Science, University of Oxford, 1922. At present engaged in research for Part II. (*Signed by*) W. H. Perkin, N. V. Sidgwick, S. G. P. Plant.

COFMAN-NICORESTI, JOSEPH, 16, Crediton Hill, London, N.W.6. British. Pharmacist. Licentiate in Pharmacy, University of Bucarest (Roumania). Member of the Pharm. Society of Great Britain. Late Analytical Chemist in the Roumanian Army (1894–5). (*Signed by*) Jules Cofman-Nicoresti, Gabriel Cofman-Nicoresti, Hartley Shaw, Gerald H. Martin.

COUTIE, ALEXANDER, 4, Priestfield Road, Edinburgh. Scottish. Research Chemist. Assistant in Department of Chemistry, University of Edinburgh. (*Signed by*) James Walker, Sydney A. Kay, H. Gordon Rule.

COUZENS, LESLIE JOHN, 101, Kensington Avenue, Manor Park, E.12. Assistant Analytical Chemist. Assistant Analytical Chemist to Messrs. Burgoyne, Burbidge & Co., Ltd., East Ham. Student at the Sir John Cass Technical Institute for the Final B.Sc. (Honours Chemistry), University of London (1924). (*Signed by*) W. H. Barker, E. D. Griffiths, W. T. Clough.

COWARD, KATHERINE HOPE, 14, Parliament Hill, N.W.3. Assistant, Physiology (Biochemistry). University College, London University. Joint authorship of several papers on Accessory Food Factors in the *Biochemical Journal*, together with Dr. J. C. Drummond, D.Sc., of University College. M.Sc. of Manchester University. (*Signed by*) J. C. Drummond, K. A. Burke, Irvine Masson.

CRAVEN, ERNEST CECIL, 59, Southern Road, Plaistow, E.13. English. Chemist. Assistant to Dr. W. R. Ormandy, 18, Belsize Grove, N.W.3. 5 years analytical work, India Rubber Gutta Percha and Telegraph Works, Ltd., Silvertown. 2½ years as works and research chemist, U.K. Chem. Products (afterwards H.M. Factory, Sutton Oak). Since 1917 with Dr. Ormandy. Part author of various papers relating to miscibility, combustion, etc. (*Signed by*) W. R. Ormandy, A. E. Dunstan, F. B. Thole, J. S. S. Brame, J. E. Hackford.

DAVID, AUGUSTINE MALCOLM MANHKRAM, Sialkote City, India. Indian. Professor of Chemistry, Murray College, Sialkote City. B.Sc. Punjab. 2 years' teaching experience. Research on essential oils. (*Signed by*) Edwin Theodore Dean, N. A. Yajnik, S. R. Khosla.

DEAN, JOHN NORMAN, Goodbury, Kemsing, Kent. British. Assistant Research Chemist at the Gutta Percha Company, London. B.Sc. (Hons. Chemistry), King's College, Lond., Oct., 1921. A.I.C., March, 1922. (*Signed by*) Claude S. Grace, A. J. Allmand, H. W. Cremer, Samuel Smiles.

DUFF, JAMES COOPER, 13, Queen's Rd., Erdington, Birmingham. British. Lecturer, Chemistry Dept., Birmingham Technical School. M.Sc. (Manc.), F.I.C. 5 years' chemical works experience. 8 years a Lecturer on Chemistry. Author of four papers on Cobaltammines and one paper on Dimethylindigotin, all published in Trans. Chemical Society. (*Signed by*) J. Newton Friend, T. Slater Price, Harry Berry.

EARLE, ALLAN ROBERT, 90, Shadwell Rd., Portsmouth. English. Student, King's College, Cambridge. Passed Part I Natural Science Tripos (2nd Cl.)

in Chemistry, Physics, and Mineralogy. Reading for Part II in Chemistry. (*Signed by*) Eric K. Rideal, Hamilton McCombie, Harold A. Scarborough.

FENTON, SAMUEL GRAY, 27, Somerset Rd., Harrow, Middx. Pharmacist. Dispenser to John M. Pletts, M.D., L.S.A. Admiralty Surgeon and Agent, Ryde, I.W., 3 years. Senior Assistant to E. Boussin, Pharmacien, Dinard, France, 2 years. Student of Pharmacy, London Temperance Hospital, 2 years. Student of H. Wootton, B.Sc. Lond., London College, Clapham, S.W., 2 years. Student of the late Col. E. F. Harrison, Anti-Gas Dept., War Office, 1½ years. Qualified as Pharmacist, Examination of the Pharmaceutial Society of Great Britain, July 15th, 1905. Works Chemist to Messrs. Bush & Co., Manufacturing Chemists, London, W., 3 years. Member of the Pharmaceutial Society. Pharmacist, War Office Technical Staff, Army Medical Service, Whitehall, S.W., 3 years. (*Signed by*) Frank Radcliffe, Gabriel Cofman-Nicoresti, Stanley J. Peachey.

FISK, PHILLIP MARCUS, 92, Aldborough Rd., Seven Kings, Essex. Chemical Student. Associate of Finsbury Technical College (A.C.G.F.C.). Inter. Science (Lond.). (*Signed by*) M. A. Whiteley, W. S. Norris, F. R. Goss.

GILES, JOHN KENNETH, Hillcrest, Arkley, Barnet. British. Research Student. B.Sc., Lond. Engaged on research on Physical Chemistry at King's College, Lond. (*Signed by*) A. J. Allmand, C. S. Salmon, H. W. Cremer.

GRAHAM, THOMAS, 47, Canada Rd., Cardiff. Analytical Chemist. Chief Chemist to F. Campbell Harry & Co., Cardiff, for several years past and to date. Formerly Assistant Chemist with Messrs. Harry Dougall & Co., Maryport, Cumberland. (*Signed by*) Geo. R. Thompson, H. E. Cox, J. Groves, Pattinson B. Melmore, R. W. Atkinson.

GRAY, ALBERT EDWARD, 23, Gauden Rd., Clapham, London, S.W.4. British. Pharmacist with analytical experience. Appointed works chemist to the Fibrous Paper and By-products, Ltd,, a company shortly to be formed for paper manufacture and by-products of methyl alcohol, acetone, etc., from reeds by the Dinman process. (*Signed by*) Alfred Thomas, Charles Alexander McKerrow, F. C. Ray, A. Houssa.

GRIFFITHS, JOHN PREEDY, 15, Hazelwood Lane, Palmers Green, N.13. British. Student (Research, Royal College of Science, London). A.R.C.S. (Lond.). B.Sc. Hons., Chemistry (Lond.). Organic Research, Royal College of Science, London. (*Signed by*) Jocelyn Thorpe, C. K. Ingold, H. J. T. Ellingham.

HARRIS, LESLIE JULIUS, B.Sc., 18, The Park, Ealing, London, W.5. British. Research worker in Biochemistry, Cambridge University. "Analyst," XLIII, **508**, 263 *et seq.*; **511**, 345–8; **512**, 375–8; XLIV, **515**, 43–6; **521**, 314–318, and papers in other chemical journals. (*Signed by*) F. Gowland Hopkins, O. Rhys Howell, J. H. Quastel.

HARRISON, THOMAS ARTHUR, 64, Eastwood Road, Goodmayes, Essex. British. Chemist (Analytical and Consulting), Fertilisers and Disinfectants. Director, Whaller's Sanitary Fluid Co. Passed major examination Pharmaceutical Society. (*Signed by*) Charles S. Roy, Thomas D. Morson, Arthur E. Pitt.

HEWITT, LESLIE FRANK, 8, Maze Rd., Kew, Surrey. British. Research Student. Bachelor of Science, with First Class Honours in Chemistry, of the University of London; Associate of the Institute of Chemistry. (*Signed by*) Robert H. Pickard, J. Kenyon, Harold Hunter.

HORTON, LAURENCE, 45, Steade Road, Sheffield. British. Chemistry Research Student. A.R.C.S. (1st Class). B.Sc. Hons. (1st Class), London.

One year as Assistant Chemist with A. H. Allen & Partners, Public Analysts, Sheffield. (*Signed by*) C. K. Ingold, M. A. Whiteley, H. J. T. Ellingham.

INGHAM, JOHN, 19, Greyhound Road, Tottenham, N.17. British. Bacteriological Chemist. Student, Technical College, Blackburn. Five years Chemistry and Chemical Technology. Diploma (London, 1918). Pathological Society Certificates. Bacteriological Technique. Pathological Technique. Morbid Secretion Technique. Hæmatological and Serological Technique. At present interested in Biochemistry and Chemistry of Drugs. (*Signed by*) Robert H. Pickard, Geraldine Le Bas, Archibald Knox, J. Kenyon.

LAKER, JOHN, 8, Allerton Rd., N.16. British. Research Student in Organic Chemistry at the Royal College of Science. Associate of the Royal College of Science. Hons. B.Sc. (Chem.). (*Signed by*) M. A. Whiteley, James C. Philip, Jocelyn Thorpe.

LINNELL, WILFRED HERBERT, 12, Highbury, Monkseaton, Whitley Bay. British. Advanced Research Student, Armstrong College, Durham University. 1st Class Honours, B.Sc. Associate of the Institute of Chemistry. Johnston Scholar. Major Diploma of the Pharmaceutical Society. Research experience of one year. (*Signed by*) W. N. Haworth, J. A. Smythe, G. C. Leitch.

MARSH, JOSEPH KENNETH, 28, Lansdowne Road, Belfast. British. Senior Assistant, Chemical Department, Queen's University, Belfast. M.Sc. (Belfast). (*Signed by*) A. W. Stewart, H. Graham, E. W. McClelland.

MEDLEY, GEORGE ARNOLD, 45, Hill Top Rd., Dalton, Huddersfield. British. Pharmacist. Oleum, analytical, and research laboratories, British Dyestuffs Corp., Ltd., Huddersfield. (*Signed by*) James Bruce, H. H. Gray, L. Gordon Paul.

MEHTA, RAMPRASAD PITAMBERDAS, Organic Chemistry Dept., University College, London. Indian (Hindu). Research Student for Ph.D., Organic Chemistry. M.A. (Chemistry), Bombay University, 1911. Fellow in Chemistry (1910), St. Xavier's College, Bombay. Asst. Professor of Chemistry, St. Xavier's College, Bombay, 1912–13. 2nd Asst., Rajkumar College, Rajkot (India), since 1914. Acting Professor of Chemistry, Gujarat College, Ahmedabad, 1920–21 (Ag. I.E.S.). (*Signed by*) O. L. Brady, R. C. Ray, W. Pohl.

MILLER, HERBERT FREDERICK, Griffith John College, Hankow, China. English. Teacher of Chemistry in above College. Associate of the Institute of Chemistry (July 1922). B.Sc. (Hons. 2nd Class), 1922. Honours Course 3 years, Birkbeck College, London. (*Signed by*) George Senter, Arthur J. Chapman, S. Sugden.

MUKERJI, DHIRENDRA NATH, 1, Gobinda Bose Lane, Bhowanipore, Calcutta, India. Superintendent of Excise and Salt, Bengal, in charge of Distilleries, Warehouses, and Laboratories. (1) Obtained the M.Sc. degree of the Calcutta University in Chemistry in 1916 with First Class Honours, standing first in order of merit. (2) Author of (*a*) Colouring matters from 1 : 2 : 4 : 5-Tetrahydroxybenzene and related substances (*J.C.S.*, T., 1922, **121**, 545); (*b*) Vat Dyes of the Azo Series (ordered for publication in the Transactions of the *J.C.S.*). (*Signed by*) E. R. Watson, R. L. Jenks, R. L. Datta, P. C. Rây.

MURCH, WILLIAM OWEN, National Institute for Medical Research, Hampstead, N.W.3. British. Chemical Lab. Assistant. B.Sc. (Lond.). I wish to join in order to receive publications and enjoy use of library, to keep up with current research. (*Signed by*) Harold King, H. W. Dudley, P. C. L. Thorne.

Oliver, James Herbert, 22, Avenue Gardens, Acton, W.3. British. Research Worker. B.Sc. (Lond.). Research Student, Royal College of Science, London. Formerly 1st Assistant Analyst, Olympia Agricultural Coy. Research Station, Offchurch, Leamington. (*Signed by*) Jocelyn Thorpe, E. H. Farmer, F. R. Goss.

Orr, Thomas Workman, Antofagasta, Chile. Scottish. Chemist. Royal Technical College, Glasgow, 1894–97. Research Student, 1897–98. Demonstrator, 1898–99. Since continuously engaged as chemist or manager in S. Africa (1899–1901), assayer and cyaniding, and in Chile (1902–1922); chiefly in connexion with the nitrate industry. Associate of the Institute of Chemistry. (*Signed by*) G. G. Henderson, Thomas Gray, James Roberts.

Osborn, William James, 12, West Square, Southwark, S.E.1. Chemical Assistant. L.C.C., Greenwich Power Station, Greenwich, S.E. Physics, Morley College, 1910–11. Chemistry, Sir John Cass Inst., 1911–13. War service, 1915–1919. Chemistry, Borough Polytechnic, 1920–21. Chemical Assistant, Greenwich Power Station, L.C.C., Greenwich, S.E. Associated Member, London Section, Inst. of Metals. (*Signed by*) J. H. Coste, E. J. Jackman, Arthur J. Chapman.

Patterson, Jocelyn, 106, Market St., St. Andrews, N.B. British. Chemical Research Assistant in University of St. Andrews. B.Sc., 1st Class Hons., Chemistry (Dunelm). M.Sc. (Dunelm). Ph.D. (St. Andrews). Publication, Acetone Derivatives of Glucose and Fructose, Irvine and Patterson, *J.C.S.*, 1922, **121**, 2146. (*Signed by*) J. C. Irvine, R. Robinson, A. Killen Macbeth, E. L. Hirst.

Paxon, Francis James, 30, St. Georges Rd., Palmers Green, N.13. British. Research Student in Organic Chemistry at Royal College of Science. Associate, Royal College of Science. B.Sc. Hons., Lond. (*Signed by*) M. A. Whiteley, Jocelyn Thorpe, C. K. Ingold.

Perren, Edward Arthur, 70, Denton Road, London, N.8. British. Research Student at Imperial College of Science and Technology. Have undertaken research in Organic Chemistry which has been recorded in the Journal of the Society. (*Signed by*) Jocelyn Thorpe, F. W. Helsby, James C. Philip.

Press, Edwin William Stanley, 4, Porchester Sq., Hyde Park, W. Student. With F. J. Lloyd, Agricultural and Consulting Chemist, for two years. Last three years, full time student at Birkbeck College, studying for Honours Degree at University of London and Associateship of Institute of Chemistry. (*Signed by*) George Senter, F. Barrow, S. Sugden, F. J. Thorneycroft, Wm. W. Myddleton, E. J. Warren, A. Hamilton Bateman, F. J. Lloyd.

Pine, Edward Ebenezer, The Haven, Dorman's Park, Surrey. British. Chartered Accountant (not in practice). For the last 20 years I have been greatly interested in chemical theory, and I have recently published a book entitled "Atomic Form" (Longmans, Green & Co.). I am desirous of obtaining the advantage of membership of the Chemical Society in order that I may be able to extend my knowledge of Chemistry by the use of the Society's Library and Journal and by attendance at its meetings. (*Signed by*) E. F. Armstrong, W. G. Ramsay, G. Walter Knox.

Raleigh, Frank Victor (6, Cavendish Rd., Harringay, N.4). Johannesburg, South Africa. British. Student. B.Sc., B.A. (Oxford). (*Signed by*) Alfred C. Egerton, N. V. Sidgwick, Wm. Macnab.

Rana, Tara Chand, III Bridge, Srinagar, Kashmir. Indian. Making preparations for the start of Sulphuric Acid Industry from Gypsum in Kashmir. After taking the B.Sc. degree of the Punjab University, I worked for some

time as Assistant to the Chemical Examiner, Jammu and Kashmir State. In 1922 I took the M.Sc. degree of the same University. My subject of special study was "Adsorption of binary mixtures by animal charcoal," on which I have written a paper which was submitted to the University. (*Signed by*) N. A. Yajnik, S. R. Khosla, Edwin Theodore Dean.

RANDALL, HELENA CHARLOTTE, 57, Farnham Road, Guildford, Surrey. British. Science Mistress. A.R.C.S., B.Sc. I am desirous of keeping in touch with chemical literature. (*Signed by*) James C. Philip, H. B. Baker, M. A. Whiteley.

REDFERN, GEORGE ALAN, 44, Talbot Road, Highgate, N.6. Student of Chemistry at the University of Cambridge, proceeding to the profession of Chartered Patent Agent. Passed the examinations in Chemistry and Engineering for the ordinary B.A. degree. (*Signed by*) A. J. Berry, Charles T. Heycock, R. H. Atkinson.

ROBERTSON, JERRY, 38, Church St., Heckmondwike. British. Student for major examination of the Pharmaceutical Society, also F.S.M.C. Diploma. Chemist, minor qualifications of the Pharmaceutical Society. Was employed for 2 years as laboratory assistant with Messrs. Goodhall, Backhouse, Manufacturing Chemists, Leeds. Later, student at the South-Western Polytechnic Institute, Chelsea. (*Signed by*) C. Morton, Francis Arnall, F. H. Lowe, J. B. Coleman.

SANDERS, EDGAR, The White House, Blackwell, Worcs. British. Student of Chemistry, University of Birmingham. Final Chemistry examination for B.Sc. degree. (*Signed by*) G. T. Morgan, C. E. Wood, S. R. Carter, Wm. Wardlaw.

SHOESMITH, JOHN BALDWIN, c/o Dunnill, 10, Spottiswoode Rd., Edinburgh. British. Lecturer in Chemistry, Edinburgh University. Articled pupil, Public Analyst, Burnley, 1913–16. B.Sc. (Chemistry, 1st Class Hons.), Manchester University, 1919. Graduate Scholar, Manc. University, 1919. M.Sc., Manc. University, 1920. Lecturer in Chemistry, Edinburgh University, 1921. Publication, T., 1922, 121, 1391. (*Signed by*) James Walker, H. Gordon Rule, Sydney A. Kay.

SLOMAN, HEDLEY ARCHIBALD, "Robinhood," Undercliff Gardens, Leigh-on-Sea, Essex. British. Chemist. 1st Class, Part I, Nat. Sci. Tripos, Cambridge, in Chemistry, Physics, and Geology. 2nd Class, Part II, Nat. Sci. Tripos, Cambridge, in Chemistry. Associate of Institute of Chemistry. Desires to use the Library, attend the meetings, and receive the Journal. (*Signed by*) W. J. Pope, C. T. Heycock, W. H. Mills.

SMITS, ANDREAS, The University, Nieuwe Prinsengracht 126, Amsterdam, Holland. Dutch. Director of the Laboratorium Algemeeneen Anorganische Chemie der Universiteit, Amsterdam. Author of several papers in numerous chemical journals. (*Signed by*) James C. Philip, Jocelyn Thorpe, Irvine Masson.

SNELLGROVE, DOUGLAS ROSEBERY, 73, Millbrook Rd., Southampton. British. Research Student. B.Sc. (Hons. Chem., 1st Class). Now a Research Student at Battersea Poly. (*Signed by*) J. Kenyon, J. L. White, A. Houssa.

STARK, ARTHUR ROY, 76, De la Pole Avenue, Hull. British. Cement Works Chemist (chief). 6 years' training Technical College (Chemistry Dept.), Hull. Works experience in analysis of oils, residual meals, water, etc. Experimental work on treatment of coal at various temperatures. Experimental work on effect of various reagents and colours on the setting and hardening of Portland cement and concrete. At present chief chemist at

Messrs. G. & T. Earle, Ltd., Cement Manufacturers. (*Signed by*) Frank S. Wood, T. Luxton, Harry Thompson, Edward Chapman.

TEBBIT, REGINALD ERNEST, 120, Lordship Lane, E. Dulwich, London, S.E.22. English. Student. Graduate of Finsbury Technical College (A.C.G.F.C.) (4th year Student.) I am desirous of attending the meetings and of using the library of the Society. (*Signed by*) Arthur J. Hale, J. E. B. Price, Julius Jung, H. M. Atkinson.

THOMAS, JOHN SMEATH, 179, Kingsley Road, Liverpool. British. Senior Lecturer on Analytical Chemistry, University of Liverpool. D.Sc. (Liverpool). For several years Senior Lecturer on Analytical and Inorganic Chemistry in the University of Liverpool. Recently appointed Professor of Inorganic Chemistry in the University of Cape Town. Contributions to scientific journals. (*Signed by*) E. C. C. Baly, W. C. McC. Lewis, I. M. Heilbron, F. C. Guthrie, Harold Rogerson, Herbert H. Froysell.

THOMPSON, JOHN, 20, Marchmont Road, Edinburgh. Refinery Chemist with Messrs. Burmah Oil Coy., Rangoon. Four years under Dr. Thos. Drinkwater, College of Surgeons, Edinburgh. Two years of this period was in the capacity of demonstrator to D. P. H. Classes. Two years with H.M. Dept. of Explosives, Craigleith. (*Signed by*) Francis Arnall, L. Beaumont Tansley, F. H. Lowe.

THORP, HUBERT WILLIAM, 92, Queen's Road, Dalston, London, E.8. British. Assistant Research Chemist. Student, University College, London, Oct. 1919–Nov. 1921. Obtained B.Sc. degree, London University, Nov. 1921. (*Signed by*) T. J. Drakeley, G. J. Avey, Raymond R. Butler.

TIDESWELL, FREDERICK VINCENT, Department of Fuel Technology, The University, St. George's Square, Sheffield. British. Research Chemist, Mines Department Experimental Station, Department of Fuel Technology, The University, Sheffield. M.Sc. (Vict.), 1917. "The Constitution of Coal in relation to its Spontaneous Combustion," *Proc. S.W. Inst. Engineers*, 1920, **36**, i, 183. "A recent theory of Coking," *Fuel*, 1922, **1**, vi, 101. Joint author of following: "A chemical investigation of banded bituminous coal. Studies in the composition of coal," T., 1919, **115**, 619; "The oxidation of coal," T., 1919, **115**, 895; "The oxidation of the ingredients of banded bituminous coal. Studies in the composition of coal," T., 1920, **117**, 794; "On Dopplerite. Studies in the composition of coal," T., 1922, **121**, 2345. (*Signed by*) R. V. Wheeler, W. Payman, W. A. Batley.

TONG, ERIC WILFRED, Hollingbourne, Maidstone, Kent. English. Science Master in Secondary School. As a student of Chemistry at the Royal College of Science, London, 1919–1921. Associate of Royal College of Science (A.R.C.S.), 1921. B.Sc. (Hons.), 1st Class, Chemistry, London University, 1922. (*Signed by*) James C. Philip, H. F. Harwood, M. A. Whiteley.

TRITTON, FREDERIC JENNER, 1 Vicarage Mansions, West Green, N.15. English. Chemist, just finished degree course. Pupil assistant to Mr. W. C. Young, F.I.C. Public Analyst for six months. Analyst at Messrs. T. Morson and Sons, Ltd., Ponders End, for 15 months. B.Sc. (Lond.), Honours Chemistry, 2nd Class. (*Signed by*) Samuel Smiles, J. Huck, A. J. Allmand, Arthur Fairbourne.

VANDERSTICHELE, PAULE LAURE, Bedford College, Regent's Park, London, N.W.1. Belgian. Demonstrator in Organic Chemistry at Bedford College. M.Sc. (London). Teaching experience: Demonstrator in Chemistry at Bedford College (1917–1922). Recognised teacher of the University of London for 1922–1923. Publication: The use of $\alpha\beta$-dichlorovinylethylether for the preparation of chloroacetates and acid chlorides (Crompton and Van-

derstichele, *J.C.S.*, April 1920). The molecular refractions of chloro-, dichloro-, and chlorobromo-acetates. Thesis for the London M.Sc. examination presented May 1922. (*Signed by*) H. Crompton, J. F. Spencer, P. V. McKie, M. S. Crewdson.

WEAVER, STANLEY DOUGLAS, 27, Hastings Road, Maidstone. British. Research Student in Organic Chemistry at the Royal College of Science. Associate of the Royal College of Science. B.Sc. (Honours), to be awarded on completion of third years' study. (*Signed by*) M. A. Whiteley, C. K. Ingold, James C. Philip.

WILLIAMS, MONTAGUE, Cleveland Cottage, The Grove, Isleworth. English. At present, none. B.Sc. degree, London, 1922. 1st Class Honours in Chemistry. [Trained at University College, Reading.] (*Signed by*) H. Bassett, J. W. Dodgson, D. Roy Maxted, Reginald G. Durrant.

WILLIAMS, THOMAS ARTHUR, Ridgeway House, Mill Hill, N.W.7. British. Science Master, Mill Hill School. I have been engaged in teaching Chemistry in Secondary Schools since 1912, and am desirous of keeping abreast of developments in the Science, by means of the Society's lectures and publications, and of doing original work. (*Signed by*) D. Ll. Hammick, E. J. Bowen, C. N. Hinshelwood, H. B. Hartley, T. A. Quilliam.

WOOD, HAROLD, 39, Edmund St., Seedley, Manchester. British. Chemical Research for M.Sc. (Organic Chemistry). B.Sc., 1st Class Honours Chemistry, 1922, Manchester University. Graduate Prize. Leblanc Medal in Organic Colouring Matters. (*Signed by*) Arthur Lapworth, Henry Stephen, J. E. Myers, W. K. Slater, Arnold Weston, Colin Campbell, Wilson Baker.

Certificates have been accepted by the Council under Bye-Law I (2) in favour of the following:

ANDREWS, DONALD HATCH, Sterling Chemical Laboratory, New Haven, Conn., U.S.A. American. Assistant Instructor, Department of Chemistry, Yale University. In 1920 received the degree of B.A. in the Honours Chemistry Course at Yale University. For three years Silliman-Larned Fellow in the Graduate School of Yale University. Candidate for the degree of Ph.D. in Yale University, June 1923. Have been employed as Analyst for the United States R.R. Administration. Research Chemist, Fisk Rubber Co. (*Signed by*) L. W. Bass.

LAIRD, CLINTON N., Canton Christian College, Canton, China. Professor of Chemistry at Canton Christian College. B.A., 1903. M.A., 1905, University of Pennsylvania, Philadelphia, Pennsylvania, U.S.A. Undergraduate work at University of Pennsylvania. Graduate work at University of Pennsylvania and Columbia University, New York City. At Canton Christian College, 1905 to date. Prof. of Chemistry, 1910 to date. Wish to keep in closer touch with development of chemistry in England through the Journal that I can through the abstracts now available, and to have the Journal available for use by my students. Member of Society of Chemical Industry; American Chemical Society; Franklin Institute, American Association for the Advancement of Science. (*Signed by*) E. R. Dovey.

LITTLE, ARTHUR D., Charles River Road, Cambridge, Mass., U.S.A. American. Chairman of the Committee of the Corporation of the Massachusetts Institute of Technology in the Departments of Chemistry and Chemical Engineering. President of the American Chemical Society, 1912–1914. President of the American Institute of Chemical Engineers, 1919. (*Signed by*) C. F. Cross.

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CHAPIN, WILLIAM H. Second year college chemistry. New York 1922. pp. xii+312. ill. 15*s*. net. (*Recd.* 13/12/22.)

—— Second year college chemistry: a manual of laboratory exercises. New York 1922. pp. viii+116. ill. 7*s*. 6*d*. net. (*Recd.* 13/12/22.)

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GETMAN, FREDERICK HUTTON. Outlines of theoretical chemistry, 3rd edition. New York 1922. pp. xii+626. ill. $3.75 net. (*Recd.* 28/11/22.)

From the Publishers: Messrs. John Wiley & Sons.

HYDE, J. H. Lubrication and lubricants: a concise treatise on the theory and practice of lubrication; the physical, chemical, and mechanical properties and testing of liquid and solid lubricants, with notes on recent developments and examples from practice. London 1922. pp. x+114. ill. 2*s*. 6*d*. net. (*Recd.* 17/11/22.)

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ROBINSON, CLARK SHOVE. The recovery of volatile solvents. New York 1922. pp. 188. ill. $2.50. (*Recd.* 19/12/22.)

From the Publishers: The Chemical Catalog Company, Inc.

SOCIETY OF CHEMICAL INDUSTRY. Reports of the progress of

applied chemistry. Vols. I., 1916—VI., 1921. London 1917—1922. (*For Circulation.*) From Mr. Arnold Stevenson.

STILL, CARL. Critical survey of questions affecting the coke oven industry. [Translated from *Gluckauf*, being pp. 137—300 of *The Coke Oven Managers' Year Book.*] London [n.d.]. ill. (*Recd.* 23/11/22.)

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UNION INTERNATIONALE DE LA CHIMIE PURE ET APPLIQUÉE. Comptes rendus de la troisième conférence internationale de la chimie, Lyon 27 Juin—1 Juillet 1922. Paris [1922]. pp. 147. (*Reference.*) From the Secretary.

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GARDNER, HENRY A. Physical and chemical examination of paints, varnishes, and colors. [Washington] 1922. pp. 220. ill. [Together with 18 circulars of the U.S. Standards Specifications Board.] 52*s.* 6*d.* net. (*Recd.* 20/12/22.)

LIESEGANG, RAPHAEL ED. Kolloidchemie. 1914—1922. Dresden 1922. pp. viii+100. (*Recd.* 4/1/23.)

LITINSKY, L. Messung grosser Gasmengen: Anleitung zur praktischen Ermittlung grosser Mengen von Gas- und Luftströmen in technischen Betrieben. (Chem. Tech. in Einzeldarstellungen.) Leipzig 1922. pp. xvi+274. ill. (*Recd.* 4/1/23.)

LÜPPO-CRAMER, —. Kolloidchemie und Photographie. 2nd edition. Dresden 1921. pp. viii+112. ill. (*Recd.* 28/12/22.)

MONOGRAPHIEN AUS DEM GEBIETE DER FETT-CHEMIE. Edited by K. H. BAUER. Vol. I., etc. Stuttgart 1922+.

PRICE, DAVID J., and BROWN, HAROLD H. [and others]. Dust explosions: theory and nature of, phenomena, causes and methods of prevention. Boston, Mass. [1922]. pp. xxii+246. ill. 16*s.* 6*d.* net. (*Recd.* 20/12/22.)

PULSIFER, H. B. The determination of sulfur in iron and

steel. With a bibliography, 1797—1921. Easton, Pa. 1922. pp. vi+160. ill. 15*s.* net. (*Recd.* 15/12/22.)

WOLFF, H. Die Lösungsmittel der Fette, Öle, Wachse und Harze. (Monographien . . . der Fett-Chemie, Vol. I.) Stuttgart 1922. pp. [viii]+118. ill. (*Recd.* 9/1/23.)

WORDEN, EDWARD CHAUNCEY. Technology of cellulose esters. Vol. I, in 5 parts. New York 1921. pp. cxxvi+664, cxviii, 665—1566, cxviii, 1567—2376, cxviii, 2377—3086, 3087—3710. ill. £10 10*s.* net. (*Reference.*)

III. *Pamphlets.*

AUSTRALIA, COMMONWEALTH OF. *Institute of Science and Industry.* First annual report of the Director. Melbourne 1922. pp. 55.

BELAIEW, NICHOLAS TIMOTHY. Professor D. K. Tschernoff (1839—1921). (From the *Russian Economist*, 1922, **2**.)

CHRISTELOW, JOSEPH WILLIAM, and BOWES, E. The viscosity of raw material slurry used in the manufacture of Portland cement. (British Portland Cement Research Assoc. Pamphlet No. 2.) London 1922. pp. 23. ill.

EGYPT, *Ministry of Agriculture.* Technical and Scientific Service. Bulletin No. 20. The fixation of atmospheric nitrogen. A communication made to the Cairo Scientific Society, January 3, 1919, by FRANK HUGHES. Cairo 1922. pp. iv+14. ill.

—— —— Bulletin No. 21. Report on a soil survey of zone No. 1 (Gharbîya), 1921. By FRANK HUGHES. Cairo 1922. pp. iv+11. ill.

GIBSON, CHARLES STANLEY, and LAIDLAW, PATRICK PLAYFAIR. Estimation of chloroform in the blood after death. (From *Guy's Hospital Reports*, 1922.)

GOLDBERGER, JOSEPH, and TANNER, W. F. Amino-acid deficiency probably the primary etiological factor in pellagra. (From the *U.S. Public Health Reports*, 1922, **37**.)

GRÜN, RICHARD. Die Umschmelzung saurer Hochofenschlacken in basische Schlacken und Zement. (From *Stahl und Eisen*, 1922, **42**.)

HENDRICK, JAMES. Fertilisers before and after the war. (From the *Trans. Highland and Agric. Soc., Scotland*, 1922.)

ILLINGWORTH, STEWART ROY. Researches on the constitution of coal. London [1922]. pp. iv+62. ill.

IMPERIAL MINERAL RESOURCES BUREAU. The Mineral Industry of the British Empire and Foreign Countries. War Period. Nickel. (1913—1919.) London 1922. pp. 56.

—— —— Quicksilver. (1913—1919.) London 1922. pp. 39.

—— —— Vanadium. (1913—1919.) London 1922. pp. 19.

KINGZETT, CHARLES THOMAS. Material chemistry and immaterial matter. (From the *Chem. Trade J.*, 1922, **71**.)

KOGGERMAN, PAUL NICOLAI. The chemical composition of the Esthonian M.-Ordovician oil-bearing mineral "Kukersite." (From the *Acta et Comm. Univ. Dorpat*, 1922, A III. 6.) ill.

LORING, FREDERICK HENRY. Definition of relativity. London 1922. pp. 16.

—— Definition of the æther. London 1922. pp. 16.

—— Definition of equivalence. London 1922. pp. 16.

—— Definition of isotopes. London 1922. pp. 20.

LOTHIAN, NORMAN VEITCH CUNNINGHAM, and WARD, ARTHUR ROKEBY. The action of chlorinated water on galvanised-iron tanks. (From the *J. Roy. Army Med. Corps*, 1922, **39**.)

MCCRUDDEN, FRANCIS H. The determination of hydrogen ion concentration. (From the *U.S. Public Health Reports*, 1922.)

MARSH, JAMES ERNEST. A suggestion for the prevention of the decay of building stone. 1922. pp. 4.

ODEN, SVEN. Från en torvvetenskaplig och torvteknisk studieresa. (Meddelande 15, Ingeniörsvetenskapsakademien.) Stockholm 1922. pp. 34.

RAU, MADYAR GOPAL, and SIMONSEN, JOHN LIONEL. Oils and fats from the seeds of Indian forest trees. Parts I—V. (From the *Indian Forest Records*, 1922, **9**.)

READ, JOHN. A study in historical chemistry, being the Livingstone lectures for 1922. Sydney [1922]. pp. 48.

SCIENTIFIC AND INDUSTRIAL RESEARCH, Department of. First report of the Adhesives Research Committee. London 1922. pp. iv+129. ill.

—— *Food Investigation Board.* Special Report No. 9, by the Engineering Committee. The transmission of heat by radiation and convection. Experiments by EZER GRIFFITHS and A. H. DAVIS. London 1922. pp. iv+44. ill.

—— —— Special Report No. 11. The bacteriology of canned meat and fish. By WILLIAM GEORGE SAVAGE, RODERICK FRANCIS HUNWICKE, and R. B. CALDER. London 1922. pp. iv+72.

—— *Fuel Research Board.* Tests on ranges and cooking appliances. By ARTHUR H. BARKER. London 1922. pp. vi+55. ill.

—— —— Technical Paper No. 5. An apparatus for the measurement of specific gravity of gases in small quantities. By ALFRED BLACKIE. London 1922. pp. ii+6. ill.

SIMONSEN, JOHN LIONEL. The essential oil from the leaves of *Abies Pindrow*, Spach. (From the *Indian Forest Records*, 1922, **8**.)

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PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, February 1st, 1923, at 8 p.m., SIR WILLIAM A. TILDEN, D.Sc., F.R.S., Past-President, in the Chair.

The following were formally admitted Fellows of the Chemical Society: E. Hope, J. Kenyon, E. A. Peach, and S. G. P. Plant.

Certificates were read for the first time in favour of:

Frank Arthur Boys, 197, St. James' Road, Croydon.
Richard Burtles, M.Sc.Tech., 1, Romanby Place, 286, Wellington Road North, Heaton Chapel, Stockport.
Ernest Alfred Coppen, 137, Hambrough Road, Southall.
William Everard Davies, 51, Lancaster Gate, W. 2.
Hildyard John Eglinton Dobson, 44, Harold Road, Upper Norwood, S.E. 19.
Maxwell Bruce Donald, A.R.C.S., A.I.C., Royal College of Science, S. Kensington, S.W. 7.
Robert George Evans, 264, Bolton Road, Ashton-in-Makerfield, Wigan.
Thomas Shirley Hele, M.A., Emmanuel College, Cambridge.
Robert Fergus Hunter, 7, St. Mary's Road, Canonbury, N. 1.
Joseph Gilbert Jackson, B.Sc., 33, Crescent Road, Sheffield.
Wilfrid Lawson, M.Sc., A.I.C., 15, Barrington Road, Sefton Park, Liverpool.
Ronald Arthur Punter, B.Sc., A.I.C., The Kraal, Bishop's Stortford.
John Sunderland, B.Sc., 70, Thornbury Drive, Bradford.
Harold George Turley, B.Sc., 150, Clonmore Street, Southfields, S.W. 18.

The following papers were read:

"Derivatives of tetrahydrocarbazole. Part II." By W. H. PERKIN and S. G. P. PLANT.

"Isolation of the oxide of a new element." By ALEXANDER SCOTT.

"The chemistry of polycyclic structures in relation to their homocyclic unsaturated isomerides. Part IV. The simulation of benzenoid properties by the five-carbon intra-annular nucleus." By C. K. INGOLD, E. A. SEELEY, and J. F. THORPE.

Ordinary Scientific Meeting, Thursday, February 15th, 1923, at 8 p.m., Prof. T. M. LOWRY, Vice-President, in the Chair.

The CHAIRMAN referred to the loss sustained by the Society, through death, of :

	Elected.	Died.
Frederick James Lloyd	Feb. 3rd, 1876.	Feb. 9th, 1923.

The CHAIRMAN announced that in accordance with Bye-Law II, the following were proposed by the Council as Honorary Fellows of the Society and that a ballot for their election would be held at the next Ordinary Scientific Meeting on March 1st.

Bohnslav Brauner.
Ernst Cohen.
Gilbert Newton Lewis.
Charles Moureu.
Amé Pictet.
Theodor Svedberg.

Certificates were read for the first time in favour of :

Kundan Lal Aggarwal, M.Sc., 93, Botley Road, Oxford.
Sidney Hartley Bales, M.Sc., A.I.C., 338, High Road, Lee, S.E. 12.
Hugh Findlay, F.I.C., 50, Bothwell Street, Glasgow.
Mary Beatrice Ford, B.Sc., 9, Heath Street, Hampstead, N.W. 3.
George Philip Gibson, B.Sc., 136, Wilford Grove, Nottingham.
Donald Bennett Huntingford, M.Sc., St. Paul's School, Jalapahar, Darjeeling, India.
Mary Evelyn Laing, M.Sc., 35, Henleaze Road, Bristol.
Stephen Miall, 157, Haverstock Hill, N.W. 3.
Victor Wallace Slater, B.Sc., 139, Ashburnham Road, Luton.
Charles Arthur Waters, B.Sc., Bank House, Queen's Avenue, Muswell Hill, N. 10.
Edith Muriel Whincop, M.Sc., 26, Eatington Road, Leyton, E. 10.

Messrs. J. D. Pratt and J. N. Sugden were elected Scrutators, and a ballot for the election of Fellows was held. The following were subsequently declared elected as Fellows :

William Bennett Adam, B.A.
George James Alexander, B.Sc.
Donald Hatch Andrews, B.A.
Arthur John Attwood, A.R.C.S.
Kenneth Claude Bailey, M.A.
Alfred Berthoud.
Ernest Alfred Blench.
John Southwell Bousfield, A.R.C.S.
Frederick Bradshaw, M.A., D.Sc.
Charles Crossley Mann Broughton, B.Sc.
Harold Eugene Buckley, M.Sc.
Robert Kenneth Callow, B.A., B.Sc.
Joseph Cofman-Nicoresti.
Alexander Coutie.
Leslie John Couzens.
Katherine Hope Coward, M.Sc.
Ernest Cecil Craven.
Augustine Malcolm Manhkram David, B.Sc.
John Norman Dean, B.Sc., A.I.C.
James Cooper Duff, M.Sc., F.I.C.
Allan Robert Earle, B.A.
Samuel Gray Fenton.
Phillip Marcus Fisk.
John Kenneth Giles, B.Sc.
Thomas Graham.
Albert Edward Gray.
John Preedy Griffiths, B.Sc., A.R.C.S.
Leslie Julius Harris, B.Sc.
Thomas Arthur Harrison.
Leslie Frank Hewitt, B.Sc., A.I.C.

Laurence Horton, B.Sc., A.R.C.S.
John Ingham.
Clinton N. Laird, M.A.
John Laker, B.Sc., A.R.C.S.
Wilfred Herbert Linnell, B.Sc., A.I.C.
Arthur D. Little.
Joseph Kenneth Marsh, M.Sc.
George Arnold Medley.
Ramprasad Pitamberdas Mehta, M.A.
Herbert Frederick Miller, B.Sc., A.I.C.
Dhirendra Nath Mukerji, M.Sc.
William Owen Murch, B.Sc.
James Herbert Oliver, B.Sc.
Thomas Workman Orr, A.I.C.
William James Osborn.
Jocelyn Patterson, M.Sc., Ph.D.
Francis James Paxon, B.Sc., A.R.C.S.
Edward Arthur Perren.
Edwin William Stanley Press.
Edward Ebenezer Price.
Frank Victor Raleigh, B.A., B.Sc.
Tara Chand Rana, M.Sc.
Helena Charlotte Randall, B.Sc., A.R.C.S.
George Alan Redfern, B.A.
Jerry Robertson.
Edgar Sanders.
John Baldwin Shoesmith, M.Sc.
Hedley Archibald Sloman, B.A., A.I.C.
Andreas Smits.
Douglas Rosebery Snellgrove, B.Sc.
Arthur Roy Stark.
Reginald Ernest Tebbit.
John Smeath Thomas, D.Sc.
John Thompson.
Hubert William Thorp, B.Sc.
Frederick Vincent Tideswell, M.Sc.
Eric Wilfred Tong, B.Sc., A.R.C.S.
Frederic Jenner Tritton, B.Sc.
Paule Laure Vanderstichele, M.Sc.
Stanley Douglas Weaver, A.R.C.S.
Montague Williams, B.Sc.
Thomas Arthur Williams.
Harold Wood, B.Sc.

The following papers were read :

"Spinacene : its oxidation and decomposition." By A. Chaston Chapman.

"Investigations on the dependence of rotatory power on chemical constitution. Part XIX. The rotatory and refractive dispersion of *d*-γ-nonyl nitrite." By R. H. Pickard and H. Hunter.

"Investigations on the dependence of rotatory power on chemical constitution. Part XX. The rotatory dispersive powers of oxygen compounds containing the secondary octyl radical." By H. Hunter.

"Studies on hypophosphorous acid. Part V. Its reaction with silver nitrate." By A. D. Mitchell.

"Communication from Drs. Hevesey and Koster concerning disparity between *X*-ray spectra of hafnium and the New Zealand element." By Alexander Scott.

"The form of the vapour-pressure curve at high temperatures. Part II. The curve for sodium cyanide." By C. K. Ingold.

"The properties of ammonium nitrate. Part V. The reciprocal salt-pair ammonium nitrate and potassium chloride." By E. P. Perman and H. L. Saunders.

"The morphine group. Part I. A discussion of the constitutional problem." By J. M. Gulland and R. Robinson.

"The morphine group. Part II. Thebainone, thebainol, and dihydrothebainone." By J. M. Gulland and R. Robinson.

"A synthesis of pyrylium salts of anthocyanidin type. Part II." By D. D. PRATT and R. ROBINSON.

List of Papers received between January 19th and February 15th, 1923:

"Tesla-luminescence spectra. Part I. The apparatus and the spectrum of benzene." By W. H. MCVICKER, J. K. MARSH, and A. W. STEWART.

"The formation of derivatives of oxalacetic acid from tartaric acid." By F. D. CHATTAWAY and G. D. PARKES.

"Derivatives of tetrahydrocarbazole. Part II." By W. H. PERKIN and S. G. P. PLANT.

"Heterogeneous equilibria between the chlorides of calcium, magnesium, potassium, and their aqueous solutions." By W. B. LEE and A. C. G. EGERTON.

"The constitution of polysaccharides. Part VI. The molecular structure of cotton cellulose." By J. C. IRVINE and E. L. HIRST.

"Calculation of fundamental constants." By E. F. MORRIS.

"Electrolysis of acetone solutions of potassium chloro- and trichromates." By E. F. MORRIS.

"Spinacene: its oxidation and decomposition." By A. CHASTON CHAPMAN.

"Isolation of the oxide of a new element." By A. SCOTT.

"The chemistry of polycyclic structures in relation to their homocyclic unsaturated isomerides. Part IV. The simulation of benzenoid properties by the five-carbon intra-annular nucleus." By C. K. INGOLD, E. A. SEELEY, and J. F. THORPE.

"The labile nature of the halogen atom in organic compounds. Part VIII. The action of hydrazine on the halogen derivatives of acetoacetic and benzoylacetic esters and benzoylacetone." By A. K. MACBETH.

"The higher oxide of nickel." By O. R. HOWELL.

"Triethylene tri- and tetra-sulphides. Part III. The sulphones, sulphinic and sulphonic acids of the series. Extension of Stuffer's law." By Sir P. C. RÂY.

"Dyes derived from thiodiphenylamine." By B. K. SEN and S. DUTT.

"Dyes derived from carbazole. Part I." By S. DUTT.

"The preparation and some reactions of bromopicrin." By L. HUNTER.

"The intermittent glow of phosphorus." By K. R. K. IYER.

"The preparation of xylose from maize cobs." By A. R. LING and D. R. NANJI.

"The effect of pressure on the limits of inflammability of mixtures of the paraffin hydrocarbons with air." By W. PAYMAN and R. V. WHEELER.

"Inorganic complex salts. Part II. Erdmann's salt and its derivatives." By W. THOMAS.

"The action of dimethyl sulphate on diphenylamine and on methyldiphenylamine." By C. S. GIBSON and D. C. VINING.

"Investigations on the dependence of rotatory power on chemical constitution. Part XIX. The rotatory and refractive dispersion of *d*-γ-nonyl nitrite." By R. H. PICKARD and H. HUNTER.

"Investigations on the dependence of rotatory power on chemical constitution. Part XX. The rotatory dispersive powers of oxygen compounds containing the secondary octyl radical." By H. HUNTER.

"Studies on hypophosphorous acid. Part V. Its reaction with silver nitrate." By A. D. MITCHELL.

"The catalytic decomposition of hydrogen peroxide solution by sugar carbon." By J. B. FIRTH and F. S. WATSON.

"Chloroiodoacetic acid." By H. CROMPTON and K. M. CARTER.

"On the calorific power of carbon compounds." By D. KONOVALOV.

"The form of the vapour-pressure curve at high temperatures. Part II. The curve for sodium cyanide." By C. K. INGOLD.

"The properties of ammonium nitrate. Part V. The reciprocal salt-pair ammonium nitrate and potassium chloride." By E. P. PERMAN and H. L. SAUNDERS.

"The molecular refractions of chloro-, dichloro-, and chlorobromo-acetates." By P. L. VANDERSTICHELE.

"On the conditions of reaction of hydrogen with sulphur." By R. G. W. NORRISH and E. K. RIDEAL.

"Photochemical reactions of the halogen hydrides." By W. H. RODEBUSH and J. NEVYAS.

"Studies of the glucosides. Part II. Arbutin." By A. K. MACBETH and J. MACKEY.

"The action of sulphur and sulphur compounds on the terpenes and the adaptation of the products of reaction for making a preparation of liquid gold for ceramic industry." By P. P. BUDNIKOFF and E. A. SHILOV.

"Sur le yodure d'azote." By C. GLUGLIOTTO.

"The combustion of complex gaseous mixtures. Part II. Mixtures of carbon monoxide and hydrogen with air." By W. PAYMAN and R. V. WHEELER.

"Bromo-derivatives of 4-methylglyoxaline." By F. L. PYMAN and G. M. TIMMIS.

"The morphine group. Part I. A discussion of the constitutional problem." By J. M. GULLAND and R. ROBINSON.

"The morphine group. Part II. Thebainone, thebainol, and dihydrothebainone." By J. M. GULLAND and R. ROBINSON.

"A synthesis of pyrylium salts of anthocyanidin type. Part II." By D. D. PRATT and R. ROBINSON.

"The bromination of glyoxaline-4-carboxyanilide." By H. KING and W. O. MURCH.

"Phosphorous acid esters. The influence of the character of the groups R′R″R‴ upon the stability of the molecular complexes $R'R''R'''C{-}OPCl_2$ and $R'R''R'''C{-}OP(OH)_2$. Part I." By D. R. BOYD and G. CHIGNELL.

"Co-ordination compounds and the Bohr atom." By N. V. SIDGWICK.

"Silver salvarsan." By W. H. GRAY.

ANNUAL GENERAL MEETING.

The Annual General Meeting will take place on Thursday, 22nd March, 1923, at 4 p.m. when Sir James Walker will deliver his address entitled "Symbols and Formulæ."

ANNIVERSARY DINNER.

The Anniversary Dinner will be held at the Hotel Cecil, Strand, on March 22nd, at 7 for 7.30 p.m., the day of the Annual General Meeting. The presence of ladies will be welcomed.

Tickets, price 12*s.* 6*d.* each (not including wine), can be obtained from the Assistant Secretary, to whom application should be made as soon as possible.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

BELAIEW, NICHOLAS TIMOTHY. Crystallisation of metals: being a course of advanced lectures in metallurgy. London [1923]. pp. 144. ill. 7*s.* 6*d.* net. (*Recd.* 22/1/23.) From the Author.

CROSS, CHARLES FREDERICK, and DORÉE, CHARLES. Researches on cellulose. IV (1910–1921) (Vol. IV of the series "Cross and Bevan"). London 1922. pp. x + 254. ill. 15*s.* net. (*Recd.* 1/2/23.) From the Authors.

HEMMING, EMILE. Plastics and molded electrical insulation. New York 1923. pp. viii + 314. ill. $5 net. (*Recd.* 7/2/23.)
From the Publishers: The Chemical Catalog Company, Inc.

HEWITT, JOHN THEODORE. Synthetic colouring matters: dyestuffs derived from pyridine, quinoline, acridine, and xanthene. London 1922. pp. xii + 406. 14*s.* net. (*Recd.* 15/1/23.)
From the Author.

INSTITUTE OF METALS. Journal. Name-Subject index to Vols. I—XXV, 1909—1921. London 1922. pp. vi + 490. (*Reference.*)
From the Institute.

KEHRMANN, FRIEDRICH. Gesammelte Abhandlungen. Vol. I. Leipzig 1922. pp. viii + 203. (*Recd.* 27/1/23.)
From the Publisher: Herr Georg Thieme.

ORGANIC SYNTHESES: an annual publication of satisfactory methods for the preparation of organic chemicals. Vol. II, edited by JAMES BRYANT CONANT, HANS THACHER CLARKE, ROGER ADAMS, and OLIVER KAMM. New York 1922. pp. viii + 100. ill. 7*s.* 6*d.* net. (*Recd.* 5/2/23.)
From the London Publishers: Messrs. Chapman & Hall.

SPENCER, JAMES FREDERICK. Les métaux des terres rares. Translated by J. DANIEL. Paris 1922. pp. x + 280. ill. (*Recd.* 26/1/23.)
From the Author.

WAESER, BRUNO. Die Luftstickstoffindustrie. Mit besonderer Berücksichtigung der Gewinnung von Ammoniak und Salpetersäure. (Chem. Tech. in Einzeldarstellungen.) Leipzig 1922. pp. viii + 586. ill. (*Recd.* 27/1/23.)
From the Publisher: Herr Otto Spamer.

WEYL, THEODOR. [Editor.] Die Methoden der organischen Chemie. 2nd edition. Edited by JOSEF HOUBEN. Vol. II. Leipzig 1922. pp. xxviii + 1115. ill. (*Recd.* 5/2/23.)
From the Publisher: Herr Georg Thieme.

YOUNG BREWER'S MONITOR, THE, comprising a luminous and scientific summary of that very ancient and important art; with a series of cautionary precepts for conducting, with peculiar economy and safety, the various critical operations of the brewery. London 1824. pp. viii + 120. (*Recd.* 1/2/23.)
From Dr. Alexander Scott.

II. *By Purchase.*

AMERICAN SOCIETY FOR TESTING MATERIALS. A.S.T.M. Standards. Issued triennially. 1921. Philadelphia 1921. (*Reference.*)

BARY, PAUL. Le caoutchouc. Paris 1923. pp. vi + 256. ill. 29 *fr.* net. (*Recd.* 17/1/23.)

BROCK, A. ST. H. Pyrotechnics: the history and art of firework

making. London 1922. pp. xvi + 198. ill. 25*s.* net. (*Recd.* 17/1/23.)

CLAYTON, WILLIAM. The theory of emulsions and emulsification. London 1923. pp. viii + 160. ill. 9*s.* 6*d.* net. (*Recd.* 17/1/23.)

ECKEL, EDWIN CLARENCE. Cements, limes, and plasters: their materials, manufacture, and properties. 2nd edition. New York 1922. pp. xxxii + 655. ill. 32*s.* 6*d.* net. (*Recd.* 22/1/23.)

EHRMANN, ÉDOUARD. Traité des matières colorantes organiques et de leurs diverses applications. Paris 1922. pp. xxiv + 616. 63·75 *fr.* net. (*Recd.* 1/2/23.)

FREUNDLICH, HERBERT. Kapillarchemie: eine Darstellung der Chemie der Kolloide und verwandter Gebiete. 2nd edition. Leipzig 1922. pp. xvi + 1182. ill. (*Recd.* 12/1/23.)

GIBSON, CHARLES STANLEY. The chemistry of dental materials. London 1922. pp. 176. ill. 12*s.* 6*d.* net. (*Recd.* 22/1/23.)

GREENISH, HENRY GEORGE. The microscopical examination of foods and drugs. 3rd edition. London 1923. pp. xx + 386. ill. 18*s.* net. (*Recd.* 17/1/23.)

LEVY, LEONARD. Gasworks recorders. London 1922. pp. xii + 246. ill. 35*s.* net. (*Recd.* 22/1/23.)

LIDDELL, DONALD M. [Editor.] Handbook of chemical engineering. 2 vols. New York 1922. pp. x + 518, vi, 519—1008. ill. 40*s.* net. (*Recd.* 17/1/23.)

MULLIKEN, SAMUEL PARSONS. A method for the identification of pure organic compounds by a systematic analytical procedure based on physical properties and chemical reactions. Vols. I, II, and IV. New York 1904—1922. pp. xii + 264, x + 328, viii + 238. ill. 80*s.* net. (*Recd.* 25/1/23.)

NOYES, ARTHUR AMOS, and SHERRILL, MILES STANDISH. An advanced course of instruction in chemical principles. New York 1922. pp. xviii + 310. ill. 18*s.* net. (*Recd.* 27/1/23.)

PASTEUR, LOUIS. Œuvres. Collected by PASTEUR VALLERY-RADOT. Vols. I and II. Paris 1922. pp. x + 480, viii + 664. ill. 115 *fr.* net. (*Recd.* 1/2/23.)

UNDERHILL, FRANK PELL. The lethal war gases: physiology and experimental treatment. An investigation by the section on intermediary metabolism of the medical division of the chemical warfare service at Yale University. New Haven 1920. pp. xiv + 310. ill. 75*s.* net. (*Recd.* 2/2/23.)

III. *Pamphlets.*

ASSOCIATION OF BRITISH CHEMICAL MANUFACTURERS and BRITISH CHEMICAL PLANT MANUFACTURERS' ASSOCIATION. *Joint Research Committee on Chemical Plant.* Report of sub-committee for standardisation of filter-press plates. London [1922]. pp. 15. ill.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, March 1st, 1923, at 8 p.m., Professor H. B. Dixon, C.B.E., F.R.S., Past-President, in the Chair.

It was announced that the Society had lost, through death, Mr. Frank Hughes, who was elected on Feb. 15th, 1894.

The following List of Nominations for vacant places on the Council was read from the Chair:

President.—W. P. Wynne.

Vice-Presidents who have filled the office of President (two vacancies).—Sir William J. Pope; Sir James Walker.

Vice-Presidents who have not filled the office of President (three vacancies).—J. T. Hewitt; G. T. Morgan; J. M. Thomson.

Treasurer.—J. F. Thorpe.

Ordinary Members of Council: (*a*) Town Members, that is, those resident within 50 miles of Charing Cross (three vacancies).—C. K. Ingold; G. W. Monier-Williams; J. Reilly. (*b*) Country Members, that is, those resident beyond 50 miles from Charing Cross (three vacancies).—E. F. Armstrong, W. N. Haworth; H. McCombie.

Messrs. G. J. Alexander, E. A. Blench, P. M. Fisk, W. O. Murch, R. E. Tebbit, W. Thomas, F. J. Tritton, and M. Williams were formally admitted Fellows of the Chemical Society.

Certificates were read for the first time in favour of:

Joseph Arthur Baume, 21, Watcombe Circus, Carrington, Nottingham.
Thomas Vincent Blake, 208, Albany Road, Cardiff.
Joseph Brown, 24, Riversdale Terrace, Sunderland.
Basil Elmsley Coke, O.B.E., B.A., Army and Navy Club, Pall Mall, S.W. 1.
Gordon William Dorrell, B.Sc., 1, Niederwald Road, Sydenham, S.E. 26.
Willis Alexander Gibbons, A.M., Ph.D., 561, West 58th Street, New York.
John Thomas Holden, B.Sc., 123, Percy Road, Shepherd's Bush, W. 12.
Robert Barry Johns, 36, Chapel Road, Northenden, Manchester.

William Hugh Jones, B.Sc., Victoria Villa, Burgess Tower, Denbigh.
Narain Das Kehar, B.Sc., Rupar District, Amballa, India.
Wilfrid Leslie Lamb, M.A., St. Laurence College, Ramsgate.
Arthur Milnes Morley, M.Sc.Tech., A.I.C., 158, Oldham Road, Miles Platting, Manchester.
Kanwal Nain, c/o S. M. A. Shah, Esq., Royal Veterinary College, Camden Town, N.W. 1.
Charles Ashe Pelley, Burton Garth, Courtland Road, Paignton.
Albert Rose, 4, Moorland View, Higher Eldwick, Yorks.
Sidney Walter Saunders, B.Sc., 139, Riverdale Road, Erith.
Christopher Caiger Smith, B.Sc., The Ferns, Eversley Crescent, Isleworth.
Daniel Whitehead Steuart, B.Sc., Melrose, Uxbridge Road, Southall.
Allan Miles Ward, B.Sc., The Croft Cottage, Bridge Street, Walton-on-Thames.
Edward Johnson Wayne, 20, Cowper Street, Leeds.
Mahomed Yacob, M.B., B.S., c/o S. M. A. Shah, Esq., Royal Veterinary College, Camden Town, N.W. 1.

Miss F. M. G. Micklethwait and Dr. M. A. Whiteley were appointed Scrutators, and a ballot for the election of Honorary Fellows was held. The following were subsequently declared duly elected as Honorary Fellows: Bohuslav Brauner, Ernst Cohen, Gilbert Newton Lewis, Charles Moureu, Amé Pictet, Theodor Svedberg.

The following papers were read:

"Co-ordination compounds and the Bohr atom." By N. V. Sidgwick.

"Silver salvarsan." By W. H. Gray.

"On the propagation of the explosion-wave. Part I. Hydrogen and carbon monoxide mixtures." By H. B. Dixon and N. S. Walls.

"The molecular configuration of polynuclear aromatic compounds. Part II. 4 : 6 : 4′-Trinitrodiphenic acid and its resolution into optically active components." By G. H. Christie and J. Kenner.

"Physostigmine. Part I. Alkylation products of eseroline." By G. Barger and E. Stedman.

Ordinary Scientific Meeting, Thursday, March 15th, 1923, at 8 p.m., Prof. T. M. Lowry, C.B.E., F.R.S., Vice-President, in the Chair.

It was announced that the Society had lost, through death, the following Honorary Fellow:

	Elected.	Died.
Johannes Diderik van der Waals	Jan. 20th, 1898.	March 8th.

The following were formally admitted Fellows of the Chemical Society: D. A. Hoffert, F. J. Paxon, and S. D. Weaver.

Certificates were read for the first time in favour of:

Jyoti Prokash Bose, M.B., 25, Mohendra Bose Lane, Shambazar, Calcutta.
John Dexter, B.A., B.Sc., King's College, Cambridge.
Khwaja Habib Hassan, B.Sc., B.Sc.Agric., Industrial Laboratory, Hyderabad, Deccan, India.
Ernest Avery Roff, B.Sc., Roseville, St. Margaret's, Twickenham.
Eugene Rothstein, 8, Woodchurch Road, N.W. 6.
Norman Frederick Watterson, B.Sc., A.I.C., Constitution Hill, Wellington, Salop.

The following papers were read:

"The oxime of mesoxamide (*iso*nitrosomalonamide) and some allied compounds. Part III. Ring formation in the tetra-substituted series." By E. H. USHERWOOD and M. A. WHITELEY.

"The preparation and stability of cuprous nitrate and other cuprous salts in the presence of nitriles." By H. H. MORGAN.

"The interaction of hydrogen sulphide, thiocyanogen, and thiocyanic acid with unsaturated compounds." By F. CHALLENGER, A. L. SMITH, and F. J. PATON.

"The polarity of double bonds." By T. M. LOWRY.

"A direct synthesis of certain xanthylium derivatives." By D. D. PRATT and R. ROBINSON.

BAEYER MEMORIAL LECTURE.

The Baeyer Memorial Lecture will be delivered by Professor W. H. Perkin, LL.D., F.R.S., in the Lecture Hall of the Institution of Mechanical Engineers, Storey's Gate, Westminster, on Thursday, May 10th, 1923, at 8 p.m.

List of papers received between February 16th and March 15th, 1923:

"On the propagation of the explosion-wave. Part I. Hydrogen and carbon monoxide mixtures." By H. B. DIXON and N. S. WALLS.

"Absorption of light by some acids and their salt solutions; a new method of determining extinction-coefficient in the ultra-violet." By J. C. GHOSH.

"Condensation of fluorenone with phenols." By B. K. SEN and S. DUTT.

"The oxidation of triethylene tetrasulphide with potassium permanganate." By P. C. RÂY.

"The nitro-derivatives of *m*-cresol." By G. P. GIBSON.

"The application of the Hofmann reaction to substituted carbamides." By G. R. ELLIOTT.

"The molecular configuration of polynuclear aromatic compounds. Part II. 4 : 6 : 4′-Trinitrodiphenic acid and its resolution into optically active components." By G. H. CHRISTIE and J. KENNER.

"Reactions of thiosemicarbazones. Part II. Action of esters of α-halogenated acids." By F. J. WILSON and R. BURNS.

"The ignition of mixtures of hydrogen and oxygen by sudden compression." By H. T. TIZARD.

"The oxime of mesoxamide (*iso*nitrosomalonamide) and some allied compounds. Part III. Ring formation in the tetra-substituted series." By E. H. USHERWOOD and M. A. WHITELEY.

"Physostigmine. Part I. Alkylation products of eseroline." By G. BARGER and E. STEDMAN.

"The preparation and stability of cuprous nitrate and other cuprous salts, in the presence of nitriles." By H. H. MORGAN.

"The oxidising properties of sulphur dioxide. Part IV. Molybdenum sulphates." By W. WARDLAW and N. D. SYLVESTER.

"Synthesis of 1 : 2-dimethyl-4-hydroxyanthraquinone." By A. FAIRBOURNE and J. M. GAUNTLETT.

"The interaction of hydrogen sulphide, thiocyanogen, and thiocyanic acid with unsaturated compounds." By F. CHALLENGER, A. L. SMITH, and F. J. PATON.

"The polarity of double bonds." By T. M. LOWRY.

"Organo-derivatives of thallium. Part VI. Compounds of the type R_2TlX." By A. E. GODDARD.

"Studies on the dolomite system. Part I. The nature of the substance dolomite." By A. E. MITCHELL.

"Studies in organic compounds containing sulphur. Part I. The effect on general absorption due to the valency and mode of linkage of the sulphur atom." By D. T. GIBSON, H. GRAHAM, and J. REID.

"The influence of nitro-groups on the reactivity of substituents in the benzene nucleus. Part VII. Reactions of 2 : 5- and 4 : 5-dinitro-*m*-xylenes." By K. IBBOTSON and J. KENNER.

"A direct synthesis of certain xanthylium derivatives." By D. D. PRATT and R. ROBINSON.

"The isomerism of the crotonic and the β-chloro-crotonic acids." By F. H. MCDOWALL.

"The velocity of reaction in mixed solvents. Part V. *a*. The velocity of formation of quaternary ammonium salts. *b*. The study of an intramolecular change." By J. DEXTER, H. MCCOMBIE, and H. A. SCARBOROUGH.

"The chemistry of the three-carbon system. Part I. The in-

fluence of the *cyclo*hexane ring on the αβ-βγ-change." By S. F. BIRCH, G. A. R. KON, and W. S. G. P. NORRIS.

"Imino-aryl ethers. Part II. The thermal decomposition of *N*-arylaryliminoaryl ether hydrochlorides." By A. W. CHAPMAN.

"The Tesla-luminescence of compounds. Part II. The effect of varying temperature and pressure on the benzene spectrum." By W. H. MCVICKER and J. K. MARSH.

"The fluorescence spectrum of benzene vapour." By W. H. MCVICKER and J. K. MARSH.

"Dyes derived from phenanthraquinone. Part II. Phenanthraimidazoles." By A. C. SIRCAR and G. C. SIRCAR.

"Studies on thallium compounds. Part II. The reduction of thallic compounds with ferrous sulphate and with sodium arsenite." By A. J. BERRY.

"The photochemistry of unstable substances." By E. J. BOWEN.

"The labile nature of the halogen atom in organic compounds. Part IX. The electrical conductivities and the reduction of derivatives of nitroform." By T. HENDERSON, E. L. HIRST, and A. K. MACBETH.

"The molecular configurations of polynuclear aromatic compounds. Part III. 3 : 5 : 3′ : 5′-Diphenyl tetracarboxylic acid." By H. BURTON and J. KENNER.

"The viscosity of some cellulose acetate solutions." By E. W. J. MARDLES.

CERTIFICATES OF CANDIDATES FOR ELECTION AT THE BALLOT TO BE HELD AT THE ORDINARY SCIENTIFIC MEETING ON THURSDAY, MAY 3RD, 1923.

N.B.—The names of those who sign from "General Knowledge" are printed in *italics*.

AGGARWAL, KUNDAN LAL, 93, Botley Road, Oxford. Indian. Student. Passed the M.Sc. exams. of the Punjab University in 1922, standing first in the Province, getting a 1st Class. Acted as a student demonstrator in Chemistry to the B.Sc. class for two years at the Forman Christian College, Lahore (India). (*Signed by*) Vidya Sagar Puri, Hubert T. S. Britton, Alan Newton Campbell.

BALES, SIDNEY HARTLEY, 338, High Road, Lee, S.E. 12. British. Chemist. M.Sc. (Leeds). Associate Institute of Chemistry. Nearly seven years' analytical and experimental investigation work in Directorate of Chemical Inspection, Royal Arsenal, Woolwich (present post). Principal author of "Note on Hydrolysis of ββ′-Dichlorodiethyl Sulphide (*Trans.*, Oct. 1922). (*Signed by*) A. Vincent Elsden, W. L. Baillie, Alex. J. Boyd, E. Francis Smith.

BAUME, JOSEPH ARTHUR, 21, Watcombe Circus, Carrington, Nottingham. Dyestuff and Chemical Merchant. Student at Nottingham University College, studying Organic and Inorganic Chemistry, and also Dyeing and Bleaching. (*Signed by*) F. S. Kipping, F. C. Laxton, S. J. Pentecost.

BLAKE, THOMAS VINCENT, 208, Albany Road, Cardiff. English. Industrial Chemist (Gas Works) to Cardiff Gas Light & Coke Company. 6 years Chief Chemist at Leicester Gas Works. 4 years Chief Chemist at Cardiff Gas Works. Full technological certificates in both Gas Engineering and Gas Supply (1921–22) with Inorg. and Organic Chemistry and Building Construction as qualifying subjects. (*Signed by*) D. Owen Davies, Harold M. Royle, J. H. Canning.

BOSE, JYOTI PROKASH, M.B., 25, Mohendra Bose Lane, Shambazar, Calcutta, India. Indian, Bengali. Research Scholar on Diabetes, School of Tropical Medicine and Hygiene, Calcutta. (1) Bachelor of Medicine, Calcutta University, 1919. (2) Gold medallist in chemistry and physics of the Indian Association for the Cultivation of Science, 1913. (3) Post-graduate worker in Analytical Chemistry, Chemical Laboratory, Medical College, Calcutta, 1920. (4) Post-graduate worker in Bio-chemistry with special reference to research work on Diabetes at St. Bartholomew's Hospital, London, 1921–1922. (5) Author of a new colorimetric method for quantitative determination of sugar in normal urine (in collaboration with Dr. Mackenzie Wallis, of Bart.'s, London). (6) Author of the following papers: (*a*) "Glycosuria in Pregnancy" (jointly with Dr. Mackenzie Wallis of Bart.'s), Journal of Obstetrics and Gynæcology of the British Empire, Vol. 29, summer, 1922. (*b*) "General Review on Diabetes," Indian Journal of Medicine, January 1923. (*c*) "Glucose Tolerance Tests and their Interpretations," read at the Science Congress, January 1923. (*Signed by*) Chuni Lal Bose, Sudhamoy Ghosh, Beni Madhub Chakravarti.

BOYS, FRANK ARTHUR, 197, St. James' Road, Croydon. British. Pharmacist. Reason for desiring admission: To keep in touch with the developments of chemistry, and to have the use of the Society's Library. (*Signed by*) Reginald C. Bickmore, F. W. MacMahon, Fredk. G. W. Knapman.

BROWN, JOSEPH, 24, Riversdale Terrace, Sunderland. Final Honours student in Chemistry at Armstrong College, Newcastle-on-Tyne. Have studied Chemistry at Armstrong College for three years as an Honours student. (*Signed by*) W. N. Haworth, G. C. Leitch, H. V. A. Briscoe.

BURTLES, RICHARD, 1, Romanby Place, 286, Wellington Rd. North, Heaton Chapel, Stockport. British. Research Chemist (student). M.Sc.Tech. (Manchester). Studying for degree of Ph.D. Eighteen months' research at Manchester College of Technology. Joint author with Professor Pyman of a paper on "Tautomerism of Amidines" about to be published in the *Transactions*. (*Signed by*) Frank Lee Pyman, Edmund Knecht, John K. Wood.

COKE, BASIL ELMSLEY, O.B.E., Order of St. Suva, Army and Navy Club, Pall Mall, London, S.W. 1. English. Major, Royal Engineers (retd.). B.A. (Hons.) Cantab. Pt. I. Natural Sciences Tripos (Physics, Chemistry, Geology). (*Signed by*) Hamilton McCombie, Harold A. Scarborough, A. E. Cashmore.

COPPEN, ERNEST ALFRED, "Exmoor," 137, Hambrough Road, Southall, Middx. British. Lecture Assistant, Imperial College of Science (Chemistry Dept.). Solar Physic Dept. (Sir Norman Lockyer), 1884–1890. Chemistry Dept., R.C.S., 1890 to date. (*Signed by*) H. B. Baker, Jocelyn Thorpe, James C. Philip.

DAVIES, WILLIAM EVERARD, 51, Lancaster Gate, W. 2. Welsh. Chemical Engineer and Chemist. (1) Student: Demonstrator, Chemical Dept., South Wales and Mon. School of Mines, Treforest, Glam., 3 yrs. (2) Chief Chemist, Lewis Merthyr Consolidated Collieries, Ltd., Trehafod, for Mine and Coke-oven Chemistry, 2 yrs. (3) Research Chemist and Inventor and Patentee of the Everard Davies System of Fuel Distillation, embracing Gas-works Carbonisation and Gasification Plant, Coke-ovens, and Low Temperature Plant. Articles *re* same recently appeared in Gas Journal, World, and Iron and Coal Trades Review, etc. Patents secured: 127940; 131105; 136880; 165825; 143602, etc. (*Signed by*) Jenkyn A. Griffiths, Stephen N. Wellington, David Brownlie.

DEXTER, JOHN, King's College, Cambridge. English. Research Student. B.A. (Cambridge, 1st Cl. Hons., Nat. Sci. Tripos, Part II). B.Sc. (London, 1st Cl. Hons., Chemistry). (*Signed by*) Hamilton McCombie, Harold A. Scarborough, A. E. Cashmore.

DOBSON, HILDYARD JOHN EGLINTON, 44, Harold Road, Upper Norwood, S.E. 19. English. Post-graduate Research Student and Student Demonstrator at University College, Gower St., London, in the Department of Chemistry. (*Signed by*) J. N. Collie, Irvine Masson, F. G. Donnan.

DONALD, MAXWELL BRUCE, Royal College of Science, London, S.W. 7. British. Demonstrator at the Royal College of Science, London. A.R.C.S. 1921 (Chemistry). A.I.C., M.S. (M.I.T.), 1922. Chemical engineering practice. (*Signed by*) Arthur A. Eldridge, H. J. T. Ellingham, R. S. Colborne.

DORRELL, GORDON WILLIAM, 1, Niederwald Rd., Sydenham, S.E. 26. British. Post-graduate. Chemistry Research at University College, London. B.Sc. (Hons., Lond.), 1st Class in Chem., 1922. (*Signed by*) W. E. Garner, Thomas Iredale, Allan E. Mitchell.

EVANS, ROBERT GEORGE, 264, Bolton Road, Ashton-in-Makerfield, Wigan. Welsh. Mining Engineer. London University Matriculation, Sept. 1919. Assoc. Institute of Mining Engineers and the Manchester Geological and Mining Society. 3 years full-time course at Wigan Technical College, where Chemistry and the Chemistry of Fuels was taken up to London University B.Sc. standard. Desirous of keeping in touch with the developments of Chemistry so that I may continue to assist with chemical operations required in the mine. (*Signed by*) E. B. Naylor, Wilfred Harrison, Charles R. Gardner.

FINDLAY, HUGH, 50, Bothwell Street, Glasgow. British. Consulting Chemist to Messrs. J. and P. Coats, Ltd., Glasgow. Fellow of the Institute of Chemistry. 30 years' experience in textile chemistry as Chemist, Works Manager, Research Chemist, and Consultant. (*Signed by*) F. J. Wilson, John A. Cranston, A. D. Gardiner, F. W. Harris.

FORD, MARY BEATRICE, 9, Heath Street, Hampstead, N.W. 3. British Student. B.Sc. degree, London, 1915. Two years employment as temporary chemical assistant in the Government Laboratory, London. Since then I have spent two years in study in America and am at present engaged in research at the Birkbeck College. (*Signed by*) Geo. Stubbs, Eileen M. Chatt, Wm. W. Myddleton.

GIBBONS, WILLIS ALEXANDER, 561, West 58th Street, New York, U.S.A. American. In charge of Chemical Research Department, U.S. Rubber Company, General Laboratories. A.M., Ph.D., Assistant in Chemistry and Graduate Student, Cornell University, 1910–1912. Graduate Student, Columbia University, 1913–1914. Author or joint-author of various articles on Inorganic and Physical Chemistry and on the vulcanization of rubber. Patentee of various processes in connection with the manufacture of rubber

goods. Assistant Military Attaché, American Embassy, London, 1917–1918. Captain, Ordnance Department, U.S. Army. Chief of the Loading Branch Artillery Ammunition Division, Ordnance Department, 1918–1919. (*Signed by*) Wilder D. Bancroft, T. Martin Lowry, William J. Pope, Robert Robertson, R. C. Farmer.

GIBSON, GEORGE PHILIP, 136, Wilford Grove, Nottingham. British. Research Student. Student, Univ. College, Nottm., 1919 onwards. B.Sc. (Lond.), 1921, 2nd Class Hons. Chem. (*Signed by*) F. Stanley Kipping, E. B. R. Prideaux, B. D. Shaw.

HASSAN, KHWAJA HABIB, Hyderabad, Deccan, India (Industrial Laboratory). Indian. Chemist. Bachelor of Agriculture (India). Bachelor of Science, Leeds University. Two contributions to the Journal of Leather Trades Assocn. on Indian Vegetable Tannins and Effect of Acids on Tan Solution. (*Signed by*) J. B. Cohen, W. Lowson, Arthur Smithells, P. K. Dutt.

HELE, THOMAS SHIRLEY, Emmanuel College, Cambridge. British. Lecturer in Biochemistry, University of Cambridge. Fellow of Emmanuel College, Cambridge. Papers on Metabolism in Journal of Physiology. (*Signed by*) F. G. Hopkins, W. H. Hurtley, Marjory Stephenson.

HOLDEN, JOHN THOMAS, 123, Percy Rd., Shepherds Bush, W. 12. British. Assistant Chemist to the British Launderers Research Association. B.Sc. (Lond.). In order to keep in touch with recent developments of Chemistry, and to use the Library. (*Signed by*) R. G. Parker, Harold Hunter, E. C. Edgar.

HUNTER, ROBERT FERGUS, 7, St. Mary's Rd., Canonbury, N. 1. British. Student of Chemistry at the Royal College of Science. Intermediate B.Sc., Honours. Studying for B.Sc. Honours and A.R.C.Sc., to be followed by Ph.D. (*Signed by*) H. B. Baker, P. C. Bull, H. F. Harwood.

HUNTINGFORD, DONALD BENNETT, St. Paul's School, Jalapahar, Darjeeling, India. Student, East London College, Oct. 1916–Oct. 1919. Graduated with 2nd Class Hons., Oct. 1919. Lecturer and Demonstrator, East London College, Oct. 1919–Jan. 1923. Admitted as Associate of the Institute of Chemistry, Nov. 1922. Passed M.Sc. Degree, Jan. 1923. Royal Microscopical Society's Journal, "Reduction of Osmic Acid by Lipoids," Nov. 1920, and Journal, Chemical Society, "Dissociation Pressures of Salt Hydrates" (in collaboration with Prof. J. R. Partington), Jan. 1923. (*Signed by*) J. R. Partington, F. W. Bury, Eustace E. Turner, W. H. Patterson, J. H. Coste, F. G. Pope.

JACKSON, JOSEPH GILBERT, 33, Crescent Rd., Sheffield. British. Research Student, Sheffield University. B.Sc. (1st Class Hons.) (Sheffield). Engaged in Research in Organic Chemistry at Sheffield University. (*Signed by*) W. P. Wynne, J. Kenner, Cecil H. Desch, M. A. Whiteley, James C. Philip.

JOHNS, ROBERT BARRY, 36, Chapel Road, Northenden, near Manchester. British. Relief Manager and Chemist of Essence and Chemical Depts., Merchant Taylors' School, Great Crosby, near Liverpool. Complete course in Chemistry, chiefly organic, extending over fully five years. With Messrs. C. W. Field, Ltd., Liverpool, for 7 years as technical representative for essences, flavours, drugs, etc. With Messrs. Bratby and Hinchliffe, Ltd., from 1913 to date as technical representative for ditto, also for 1 year as Assistant Chemist. Wish to join Chemical Society in order to keep abreast of modern advances in organic Chemistry through the publications of the Society. (*Signed by*) W. McHutchison, Andrew S. Matchett, R. T. Thomson.

JONES, WILLIAM HUGH, Victoria Villa, Burgess Tower, Denbigh (165,

Ramsay Rd., Forest Gate, London, E. 7). British. Teacher (L.C.C. School). B.Sc. (Hons.) (Wales), 1921, University College of North Wales, Bangor. Inter. Science (1914–1915), University College of North Wales, Bangor. Final and Honours (1919[Apl.]–1921), University College of North Wales, Bangor. 3rd Class at Honours in Chemistry. (*Signed by*) Kennedy J. P. Orton, G. W. Robinson, H. B. Watson.

KEHAR, NARAIN DAS, B.Sc., Rupar Dist., Amballa (Punjab). Hindu (non-Brahmin). Consulting chemist to the "Punjab Modern Shellac Works," Balarampur Dist., Manbhum (B.N. Ry.). I carried out special research work on "Soap Manufacture" during the last two years, submitted thesis on the subject, and won the University scholarship. At present carrying on experiments on Lac dye, Lac cultivation, and its manufacture. (*Signed by*) Edwin Theodore Dean, N. A. Yajnik, S. R. Khosla.

LAING, MARY EVELYN, 35, Henleaze Road, Bristol. Research Assistant in Physical Chemistry at the University of Bristol. M.Sc., Bristol, 1919. Publications in *Trans. Chem. Soc.*, 1918, **113**, 435; 1919, **115**, 1280; 1920, **117**, 1506; 1921, **119**, 1671; 1922, **121**, 621. (*Signed by*) F. Francis, J. W. McBain, M. Taylor.

LAMB, WILFRID LESLIE, St. Laurence College, Ramsgate. British. Senior Chemistry Master. Open exhibitioner in Natural Science, Christ Church, Oxford, 1911. M.A. Head of Routine Laboratory, H.M. Factory, T.N.T. explosive, 1915–16. R.E. (Water Filtration), Mesopotamia, 1917–19. 2nd chemistry master, Oundle School, 1919–20. Senior chemistry master, St. Laurence College, Ramsgate, 1920–. (*Signed by*) H. B. Baker, Humphrey Paget, W. H. Gray.

LAWSON, WILFRID, 15, Barrington Road, Sefton Park, Liverpool. British. Research Chemist at the Bland-Sutton Institute of Pathology, the Middlesex Hospital, W. 1. M.Sc., School of Chemistry, Liverpool University, 1919 (B.Sc., Hons., 1917). A.I.C., June 1919. Research assistant to Professor R. Robinson, D.Sc., F.R.S., Jan. 1920–Oct. 1921. (*Signed by*) E. C. C. Baly, Herbert H. Froysell, William Doran, F. C. Guthrie.

MIALL, STEPHEN, 157, Haverstock Hill, London, N.W. 3. British. Director of a public company; formerly studied Chemistry at the Yorkshire College, Leeds. (*Signed by*) Henry E. Armstrong, William J. Pope, James C. Philip.

MORLEY, ARTHUR MILNES, 158, Oldham Road, Miles Platting, Manchester. British. Demonstrator in Chemical Technology, College of Technology, Manchester. B.Sc.Tech. (Honours division), 1920. Research in physical chemistry, leading up to M.Sc.Tech. (1922). Associate of the Institute of Chemistry (1922). Joint author with Dr. J. K. Wood of the two following papers read before the Manchester Section of the Society of Dyers and Colourists on Jan. 19th, 1923: (1) "The Behaviour of Titanic Acid towards Dyestuffs"; (2) "The Behaviour of Stannic Acid towards Dyestuffs." (*Signed by*) Frank Lee Pyman, John K. Wood, F. M. Rowe.

NAIN, KANWAL, Kashmir. Indian. Chemical Examiner and Bacteriologist to Govt., Kashmir. L.M.S., Punjab, D.T.M. and H., London, D.P.H., London. Fellow of the Royal Society of Tropical Medicine and Hygiene. Fellow of the Royal Institute of Public Health. Has worked as chemical examiner for the last twelve years. (*Signed by*) V. S. Puri, H. C. Cocks, R. G. Franklin.

PELLEY, CHARLES ASHE, Burton Garth, Courtland Road, Paignton. British. Assistant Engineer and Chemist, Paignton Gas Company. Studied chemistry (practical and theoretical), Royal Albert Memorial College, Exeter,

under Prof. W. H. Lewis, M.A., F.I.C. 17 years' experience gasworks chemistry. Desirous of joining Society in order to keep in touch with chemical developments. (*Signed by*) G. W. Slatter, C. D. Birks, Ernest Quant, *B. A. Burrell.*

PUNTER, RONALD ARTHUR, The Kraal, Bishop's Stortford. British. Chemist with Messrs. Nobel Industries, Ltd. B.Sc. (London). A.I.C. Eleven years with Nobels and the Ministry of Munitions (Department of Explosives Supply) on the manufacture and development of the explosives and allied chemicals. "The Application of Researches on the viscosity of Cotton Cellulose in Industry," published in the *Journal of the Society of Chemical Industry*, 1920. (*Signed by*) Wm. Macnab, Robert Robertson, W. H. Gibson.

ROFF, ERNEST AVERY, Roseville, St. Margarets-on-Thames. British. Chemist. Student, Battersea Polytechnic, 1913–17. B.Sc. Hons. (London) 1917. Assistant chemist to Messrs. Thomas Tyrer & Co., Stratford, E., 1917–18. Chief analytical chemist to the above-named firm since 1918. (*Signed by*) Thos. Tucker, F. G. Mann, J. L. White.

ROSE, ALBERT, 4, Moorland View, Higher Eldwick, nr. Bingley, Yorks. English. Chemist-in-charge of laboratory of works manufacturing heavy chemicals. 11 years assistant chemist in a works at St. Helens and 7 years chemist-in-charge of laboratories at works in Kilwinning (Ayrshire), Manchester, and Bradford (Yorks). Author of: "Process for manufacture of a magnesium oxy-chloride cement as a binding material in the manufacture of emery wheels, in competition with the German wheel"; "A method of burning kelp to produce the maximum amount of soluble potash and iodine salts"; "An improvement in the process of manufacture of caustic soda solution from soda-ash and lime, effecting a large saving in steam consumption." (*Signed by*) J. Alexander Reddie, F. W. Richardson, A. Jaffé.

ROTHSTEIN, EUGENE, 8, Woodchurch Road, London, N.W. 6. British. Student. Third year undergraduate at the Imperial College of Science and Technology in chemistry. (*Signed by*) H. B. Baker, James C. Philip, H. F. Harwood.

SAUNDERS, SIDNEY WALTER, 139, Riverdale Road, Erith, Kent. British. Research student at University College, London. B.Sc. (Lond.). 1st class Hons. Chem., 1922. (*Signed by*) W. E. Garner, F. G. Donnan, O. L. Brady.

SLATER, VICTOR WALLACE, 139, Ashburnham Road, Luton. British. Chemist. B.Sc. (London). Asst. chief chemist, Messrs. B. Laporte, Ltd., Luton. (*Signed by*) R. Barclay Craig, J. de Carle Smith, W. D. Scouller, R. Tennant.

SMITH, CHRISTOPHER CAIGER, The Ferns, Eversley Crescent, Isleworth, Middlesex. British. Research Student at University College, London. B.Sc. (London). 1st Class Hons., 1922. (*Signed by*) F. G. Donnan, O. L. Brady, W. E. Garner.

STEUART, DANIEL WHITEHEAD, "Melrose," Uxbridge Road, Southall. Scots. Biological Chemist. B.Sc. (Agric. Edin.), 1911. Research assistant, Agric. Chem. Dept., Leeds University, 1911–14. Teacher of Agric. Chem. and Dairy Bacteriology, University College, Cardiff, 1914–17. Biological chemist, Maypole Works, Southall, 1917–. (*Signed by*) D. R. Steuart, Alexander Lauder, G. Van B. Gilmour.

SUNDERLAND, JOHN, 70, Thornbury Drive, Bradford. British. Assistant Master, Hanson Sec. School, Bradford. Chemistry Master, Truro College, 1912–15. Chemistry Master, Yeadon and Guiseley Sec. School, 1915–18 (except for war service, 1¼ years). Chemistry Master, Hanson Sec. Boys'

School, 1918–. B.Sc., London. (*Signed by*) T. M. Lowry, C. E. Womersley, R. S. Cahill.

TURLEY, HAROLD GEORGE, 150, Clonmore St., Southfields, S.W. 18. English. Research Student. Student in chemistry for 4 years. B.Sc. (Lond.), 1st Class in Honours Chemistry. I desire through the Society's publications and meetings to keep in touch with modern thought and development in chemistry. (*Signed by*) Robert H. Pickard, J. L. White, J. Kenyon.

WARD, ALLAN MILES, The Croft Cottage, Bridge St., Walton-on-Thames. British. Graduated B.Sc. (London), 1922, with 1st Class Honours in Chemistry. Now engaged on research course at Birkbeck College. (*Signed by*) George Senter, F. Barrow, F. B. Thole.

WATERS, CHARLES ARTHUR, Bank House, Queen's Avenue, Muswell Hill, N. 10. British. Industrial Chemist. B.Sc., 3rd Class Honours in Chemistry, London. I apply for election so that I may keep in touch with the latest developments of chemistry. (*Signed by*) Irvine Masson, Henry Terrey, O. L. Brady.

WATTERSON, NORMAN FREDERICK, Constitution Hill, Wellington, Salop. British. Chemistry Master, Wrekin College, Wellington, Salop. (1) B.Sc. (Lond.). A.I.C. (2) Chemist at H.M. Explosive Factory, Oldbury, July 1915 to Jan. 1919. (3) Chemistry Master, Wrekin College, Jan. 1919 to present. (*Signed by*) Frank E. Thompson, G. D. Elsdon, P. J. Lycett.

WAYNE, EDWARD JOHNSON, 20, Cowper Street, Leeds. Student. Studying for Hons. B.Sc. in Chemistry at the University of Leeds. Examination in June 1923. "The Aldehydosalicylic Acids and their Derivatives" (with Prof. J. B. Cohen), *Trans. Chem. Soc.*, June 1922. (*Signed by*) Arthur Smithells, J. B. Cohen, M. S. Leslie, H. M. Dawson, J. R. Scott, P. W. Clutterbuck.

WHINCOP, EDITH MURIEL, 26, Eatington Road, Leyton, London, E. 10. English. Teacher. M.Sc. degree in chemistry. In conjunction with Mr. G. M. Bennett, F.I.C., M.A., have published a paper in the *J.C.S.* entitled "Some Derivatives of Monothioethyleneglycol." I am still continuing research work in chemistry. (*Signed by*) J. H. Davies, G. M. Bennett, H. C. Bell.

YACOB, MAHOMED, Lahore, India. British subject. Medical Practitioner. M.B., B.S. (Punjab), D.T.M. and H. (England), D.P.H. (Oxford), F.R.Inst.P.H. (London). I did my chemistry for my M.B., B.S., and also passed an "additional test" in chemistry, and during the past 9 months have been doing analytical chemistry in the laboratory of the Royal Institute of Public Health (London), under Col. Sir William Smith and Dr. Stewart. (*Signed by*) V. S. Puri, H. C. Cocks, E. W. Maddison.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

ALEXANDER, JEROME. Glue and gelatin. New York 1923. pp. 236. ill. $3.00 net. (*Recd.* 13/3/23.)

From the Publishers: The Chemical Catalog Company, Inc.

ALLEN, J. FENWICK. Some founders of the chemical industry: men to be remembered. 2nd edition. London 1907. pp. xxxii + 290 + vi. ill. (*Recd.* 23/2/23.) From Professor P. Phillips Bedson.

ATACK, FREDERICK WILLIAM, assisted by LEONARD WHINYATES. The Chemists' Year Book 1923. 2 vols. Manchester 1923. pp. viii + 1124. ill. (*Reference.*)

From the Publishers: Messrs. Sherratt & Hughes.

BECKMANN, ERNST. Das Laboratorium für angewandte Chemie der Universität Leipzig in seiner neuen Gestaltung. Leipzig 1908. pp. 84. ill. (*Reference.*) From Professor P. Phillips Bedson.

HALL, ARCHIBALD JOHN. Dyes and their application to textile fabrics. London [1923]. pp. x + 118. ill. 3*s.* net. (*Recd.* 9/2/23.) From the Publishers: Sir Isaac Pitman & Sons.

HEIDELBERGER, MICHAEL. An advanced laboratory manual of organic chemistry. New York 1923. pp. 104. $2.00 net. (*Recd.* 20/2/23.)

From the Publishers: The Chemical Catalog Company, Inc.

MULLIKEN, SAMUEL PARSONS. A method for the identification of pure organic compounds by a systematic analytical procedure based on physical properties and chemical reactions. Vol. IV. New York [1922]. pp. viii + 238. 30*s.* net. (*Recd.* 9/2/23.)

From the London Publishers: Messrs. Chapman & Hall.

NEWTH, GEORGE SAMUEL. A text-book of inorganic chemistry. New edition. London 1923. pp. xiv + 772. ill. 8*s.* net. (*Recd.* 14/2/23.) From the Author.

THORPE, JOCELYN FIELD, and INGOLD, CHRISTOPHER KELK. Synthetic colouring matters: vat colours. London 1923. pp. xvi + 492. 16*s.* net. (*Recd.* 28/2/23.) From the Authors.

II. *By Purchase.*

ADDICKS, LAWRENCE. Copper refining. New York 1921. pp. xii + 212. ill. 15*s.* net. (*Recd.* 14/3/23.)

BLANCHARD, ARTHUR ALPHONZO, and PHELAN, JOSEPH W. Synthetic inorganic chemistry: a course of laboratory and classroom study for first year college students. 3rd edition. New York 1922. pp. xiv + 322. ill. 15*s.* net. (*Recd.* 14/3/23.)

BRUNNER, RICHARD. The manufacture of lubricants, shoe polishes and leather dressings. 3rd English edition, translated from the 6th German edition by HERBERT BIRTWHISTLE STOCKS. London 1923. pp. viii + 244. ill. 10*s.* 6*d.* net. (*Recd.* 14/3/23.)

GROUME-GRJIMAILO, W. E. The flow of gases in furnaces. Translated from the Russian into French by LEON DLOUGATCH and A. ROTHSTEIN. Translated from the French by A. D. WILLIAMS. With an appendix upon the design of open-hearth furnaces. New York 1923. pp. xxii + 400. ill. 27*s.* 6*d.* net. (*Recd.* 14/3/23.)

LEWKOWITSCH, JULIUS. Chemical technology and analysis of oils, fats, and waxes. 6th edition, revised by GEORGE H. WARBURTON. Vol. III. London 1923. pp. viii + 508. ill. 36*s.* net. (*Recd.* 12/3/23.)

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, April 19th, 1923, at 8 p.m., Professor W. P. WYNNE, D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society through the death of Sir James Dewar, and announced that the Council had passed the following resolution :—

> "On behalf of the Chemical Society the Council desires to express its sense of the great loss that the Society in particular and British science in general have sustained in the death of Sir James Dewar, who served as President from 1897—1899 and as Vice-President during a period of twenty-eight years."

On the suggestion of the President, the Fellows present expressed their concurrence in this resolution by standing.

The following deaths also were intimated :—

	Elected.	Died.
George Embrey.....	Feb. 5th, 1885.	Mar. 10th. 1923.
Herbert Henry Froysell	Feb. 15th, 1917.	Feb. 25th, 1923.
Thomas Howard	Mar. 4th, 1875.	Mar. 12th, 1923.
Robert Binnie Pettigrew	Dec. 6th, 1917.	Aug. 2nd, 1922.
Henry Walker	Dec. 4th, 1913.	Apl. 4th, 1923.
John Sanders Wilkes	Dec. 2nd, 1920.	Feb. 8th, 1923.

It was announced that the following Committees for 1923—1924 had been appointed by the Council :—

Finance Committee.—E. F. Armstrong, A. Chaston Chapman, C. A. Hill, G. T. Moody, and the Officers.

House Committee.—J. L. Baker, Sir Herbert Jackson, Alexander Scott, Sir William A. Tilden, E. W. Voelcker, and the Officers.

Library Committee.—P. P. Bedson, O. L. Brady, A. J. Greenaway (Editor), Sir Thomas K. Rose, Sir John Russell, J. M. Thomson (Chairman), Sir William A. Tilden, the Librarian, and the Officers, together with the following representatives of contributing Societies:

J. L. Baker, C. Dorée, J. C. Drummond, A. Harden, J. P. Longstaff, R. L. Mond, and G. Senter.

Publication Committee.—E. C. C. Baly, O. L. Brady, C. H. Desch, C. S. Gibson, I. M. Heilbron, J. C. Irvine, T. M. Lowry, J. W. McBain, W. H. Mills, R. H. Pickard, T. Slater Price, N. V. Sidgwick, and the Officers.

Research Fund Committee.—H. B. Baker, Sir James J. Dobbie, F. G. Donnan, G. G. Henderson, R. H. Pickard, Sir William J. Pope, R. Robinson, N. V. Sidgwick, S. Smiles, Sir James Walker, and the Officers.

The following were formally admitted Fellows of the Chemical Society: C. C. M. Broughton, J. P. Griffiths, A. B. P. Page, F. W. Stoyle, and C. Harold Wright.

Certificates were read for the first time in favour of:

Vinayak Keshav Bhagwat, M.Sc., 528, Shanwar Peth, Poona City, India.
Frederick Beaumont Hirst, Walmore, Mackenzie Street, Sharples, Bolton.
Gen-itsu Kita, Institute of Chemical Technology, Imperial University, Kyoto, Japan.
Shunzo Koizumi, Furukawa-cho, Sanjyo-minami, Kyoto, Japan.
Robert Oswald M'Cardell, 11, Gladstone Road, Urmston, Manchester.
Douglas Stewart Mitchell, 33, Loraine Road, Holloway, N. 7.
Frederick Aldis Nurse, B.Sc., 30, Oakhill Road, Sutton.
Cyril Vernon Oliver, B.Sc., 10, Hayle Road, Maidstone.
Kali Charan Pakrasi, B.Sc., Dakshineswar, Aridat P.O., Bengal, India.
Arthur Osborne Ponder, B.A., Dominion Tar and Chemical Co., Ltd., Montreal, Canada.
John Rankin, B.Sc., A.I.C., Exeter College, Oxford.
Henry Ralph Champion Scott, 5, Selwood Terrace, S. Kensington, S.W. 7.
Edward Russell Trotman, B.Sc., 3, Wellington Circus, Nottingham.
Louis Veillon, Ph.D., Brookside, Weston Rhyn, Salop.
Cyril Mason Willcox, B.A., B.Sc., 4, Worple Avenue, Wimbledon, S.W. 19.
Edwin Williams, B.Sc., A.I.C., Arosfa, Risca, Mon.
Francis George Willson, Langley, Westmount Road, Eltham, S.E. 9.

The following papers were read:

"The influence of nitro-groups on the reactivity of substituents in the benzene nucleus. Part VII. Reactions of 2 : 5- and 4 : 5-dinitro-*m*-xylenes." By K. Ibbotson and J. Kenner.

"The chemistry of the three-carbon system. Part I. The influence of the *cyclo*hexane ring on the $\alpha\beta$–$\beta\gamma$-change." By S. F. Birch, G. A. R. Kon, and W. S. G. P. Norris.

"On the promotion of catalytic reactions. Part I." By S. Medsforth.

"The action of halogens on phenylhydrazones. Part I. The action of bromine." By J. E. Humphries, E. Bloom, and R. Evans.

"The mobility of symmetrical triad systems. Part II. The

conditions relating to systems terminated by the *o*-phenylene group. Derivatives of indene." By C. K. INGOLD and H. A. PIGGOTT.

MEETINGS AND LECTURES.

The next Ordinary Scientific Meeting will be held on Thursday, May 3rd, 1923, at 8 p.m., when a ballot for the election of Fellows will be held.

The Baeyer Memorial Lecture will be delivered by Professor W. H. Perkin, F.R.S., in the Lecture Hall of the Institution of Mechanical Engineers, Storey's Gate, Westminster, on Thursday, May 10th, 1923, at 8 p.m.

On Thursday, June 14th, 1923, at 8 p.m., in the Society's Rooms, a Lecture will be delivered by Professor Charles Moureu entitled: "Les Gaz Rares des Sources Thermales, des Grisous et Autres Gaz Naturels."

The next Informal Meeting will be held on Thursday, May 17th, 1923, after the conclusion of the formal business of the Ordinary Scientific Meeting, to be held at 8 p.m.

RESEARCH FUND COMMITTEE.

A meeting of the Research Fund Committee will be held in June next. Applications for Grants, to be made on forms which can be obtained from the Assistant Secretary, Chemical Society, Burlington House, W. 1, must be received on or before Friday, June 1st, 1923.

All persons who received grants in June, 1922, or in June of any previous year, whose accounts have not been declared closed by the Council, are reminded that reports must be returned by June 1st.

LIST OF FELLOWS, 1923.

The Council has decided to supply the List of Fellows for 1923 to those Fellows only who make application to the Assistant Secretary before August 31st, 1923.

REPORT OF THE INTERNATIONAL COMMITTEE ON CHEMICAL ELEMENTS.

Copies of this Report, which embodies a Table of Isotopes and a Table of the Radioactive Elements and their Constants, will be supplied to those Fellows only who make application to the Assistant Secretary before August 31st, 1923.

INDIAN TECHNICAL PUBLICATIONS.

At the request of the Indian Trade Commissioner, the Council desires to draw the attention of Fellows to the library of Indian Technical Publications attached to the office of the Indian Trade Commissionerat at 60, Winchester House, Old Broad Street, E.C. 2.

Fellows are cordially invited to consult any of the technical publications, a list of which may be seen in the Library of the Chemical Society.

List of Papers received between March 16th and April 19th, 1923 :

"The behaviour of dilute solutions of iodine in chloroform in contact with aqueous starch solution." By J. B. FIRTH and F. S. WATSON.

"Dyes of the aurin type. Part I." By H. BAINES and J. E. DRIVER.

"The optical rotations of the sugars. Part II. The methyl pentoses and the glucosides." By J. G. MALTBY.

"Investigations of the mannan present in vegetable ivory." By J. PATTERSON.

"The hydration of agar-agar." By F. FAIRBROTHER and H. MASTIN.

"On the promotion of catalytic reactions. Part I." By S. MEDSFORTH.

"Change of properties of substances on drying. Part II." By H. B. BAKER.

"The sodium salts of phenolphthalein." By H. BASSETT and P. HALTON.

"The action of thiosulphates on cupric salts." By H. BASSETT and R. G. DURRANT.

"The propagation of flame from a spark in a closed tube through a homogenous inflammable mixture." By O. C. de C. ELLIS.

"Mercury cleansing apparatus." By A. E. DIXON and J. L. MCKEE.

The sulphides of ammonium." By J. S. THOMAS and R. W. RIDING.

"On the energy of activation in heterogeneous gas reactions with relation to the thermal decomposition of formic acid vapour." By C. N. HINSHELWOOD and B. TOPLEY.

"Researches on vertical retort tar. Part I. The phenolic constituents." By G. S. CURREY.

"The oxidation of nickel sulphide." By J. S. DUNN and E. K. RIDEAL.

"Benzbisthiazoles. Part III." By S. R. H. EDGE.

"Anodic formation of a perchloride of manganese." By A. N. CAMPBELL.

"The action of hypochlorous acid on bornylene." By G. G. HENDERSON and J. A. MAIR.

"Yohimbine (quebrachine). Part II. Apoyohimbine and desoxyyohimbine." By G. BARGER and E. FIELD.

"Isolation of the oxide of a new element. A correction." By A. SCOTT.

"The structure of saccharose." By M. BERGMANN.

"The action of halogens on phenylhydrazones. Part I. The action of bromine." By J. E. HUMPHRIES, E. BLOOM, and R. EVANS.

"The αα′-dichlorodialkyl sulphides." By F. G. MANN and W. J. POPE.

"The isomeric trithioacetaldehydes." By F. G. MANN and W. J. POPE.

"The isomerism of the oximes. Part XI. Carbethoxy-derivatives." By O. L. BRADY and G. P. MCHUGH.

"The influence of temperature on two alternative modes of decomposition of formic acid." By C. N. HINSHELWOOD and H. B. HARTLEY.

"The conversion of malonic acid into *d*-malic acid." By A. MCKENZIE and H. J. PLENDERLEITH.

"The structure of the normal monosaccharides. Part I. Xylose." By E. L. HIRST and C. B. PURVES.

"The ternary system ammonium chloride–ferric chloride–water." By F. W. J. CLENDINNEN.

"A critical solution temperature for solids in the binary system ammonium chloride–manganous chloride dihydrate." By F. W. J. CLENDINNEN and A. C. D. RIVETT.

"The mobility of symmetrical triad systems. Part II. The conditions relating to systems terminated by the *o*-phenylene group. Derivatives of indene." By C. K. INGOLD and H. A. PIGGOTT.

"Some factors which influence the volumes of precipitates." By J. H. JACKSON and A. W. STEWART.

"The ultra-violet absorption spectra of eugenol and *iso*eugenol." By G. THOMPSON.

"Some mercaptans of the purine group. Part I." By P. C. RÂY, G. C. CHAKRAVARTI, and P. K. BOSE.

"Condensation of amidines with ethoxymethylene-β-ketonic esters and β-diketones." By P. C. MITTER and J. C. BARDHAN.

"Ring-chain tautomerism. Part V. The effect of the *gem*-

dipropyl grouping on the carbon tetrahedral angle." By L. BAINS and J. F. THORPE.

"The preparation and properties of 4 : 4′-tetramethyldiaminoanthrafuchsone." By F. A. MASON.

"The theory of acid alkali solution equilibrium as applied to salts of moderately strong but sparingly soluble acids." By E. B. R. PRIDEAUX.

"The conditions of reaction of hydrogen with sulphur. Part II. The catalytic effect of oxygen. Part III. On the mechanism of the reaction of hydrogen with sulphur and its catalysis by oxygen." By R. G. W. NORRISH and E. K. RIDEAL.

"Researches on residual affinity and co-ordination. Part XVI. Normal and acid salicylatotetramminocobaltic salts." By G. T. MORGAN and J. D. M. SMITH.

ADDITIONS TO THE LIBRARY

I. *Donations.*

ALLEN, ROBERT. Copper ores. (Imperial Institute Monograph on Mineral Resources.) London [1923]. pp. x + 222. ill. 7*s*. 6*d*. net. (*Recd*. 4/4/23.) From the Director.

BAKER, T. THORNE. The spectroscope and its uses in general analytical chemistry. 2nd edition. London 1923. pp. x + 208. ill. 7*s*. 6*d*. net. (*Recd*. 26/3/23.)

From the Publishers : Messrs. Baillière, Tindall, & Cox.

BERTHOLLET, CLAUDE LOUIS. Elements of the art of dyeing. Translated from the French by WILLIAM HAMILTON. 2 vols. London 1791. pp. xii + xxxviii + 302, vi + 386. ill. (*Reference*.)

From the Institute of Chemistry.

EVANS, ULICK RICHARDSON. Metals and metallic compounds. Vols. I and II. London 1923. pp. xii + 468, xii + 396. ill. 39*s*. net. (*Recd*. 12/4/23.) From the Author.

FRANKLAND, EDWARD. Water analysis for sanitary purposes, with hints for the interpretation of results. 2nd edition. London 1890. pp. viii + 136. ill. (*Recd*. 26/3/23.)

From Mr. W. Whitaker, F.R.S.

HALE, ARTHUR JAMES. Modern chemistry, pure and applied. Vol. VI. London [1923]. pp. viii + 280. ill. (*Recd*. 26/3/23.)

From the Publishers : Messrs. Virtue & Co.

HALSE, EDWARD. Mercury ores (Imperial Institute Monograph on Mineral Resources.) London [1923]. pp. x + 102. 5*s*. net. (*Recd*. 14/4/23.) From the Director.

IMPERIAL MINERAL RESOURCES BUREAU. The Mineral Industry

of the British Empire and Foreign Countries. War Period. Silver (1913—1919). London 1923. pp. 218. 4*s*. net. (*Recd.* 22/3/23.) From the Bureau.

JAPANESE JOURNAL OF CHEMISTRY. Published by the National Research Council of Japan. Vol. I, etc. Tokyo 1922 +. (*Reference.*) From the National Research Council.

JAPANESE JOURNAL OF PHYSICS. Published by the National Research Council of Japan. Vol. I, etc. Tokyo 1922 +. (*Reference.*) From the National Research Council.

LAURENT, AUGUSTE, GERHARDT, CHARLES, and CHANCEL, GUSTAVE. Comptes rendus des travaux de chimie, 1845—1851. 7 vols. Paris 1846—1851. (*Reference.*)

From the Institute of Chemistry.

MITCHELL, CHARLES AINSWORTH. Ink. London [1923]. pp. x + 128. ill. 3*s*. net. (*Recd.* 16/4/23.)

From the Publishers : Sir Isaac Pitman & Sons.

TABLES ANNUELLES DE CONSTANTES et données numériques de chimie, de physique et de technologie. Vol. IV. 1913—1916. Paris 1921—1922. pp. xxxii + 626, xxxvi, 627—1378. (*Reference.*) £7 net. From the Comité international.

TWYMAN, F. Wavelength tables for spectrum analysis. London 1923. pp. x + 106. ill. 7*s*. 6*d*. net. (*Recd.* 6/4/23.)

From the Publishers : Messrs. Adam Hilger, Ltd.

WANKLYN, JAMES ALFRED, and COOPER, WILLIAM JOHN. Sewage-analysis : a practical treatise on the examination of sewage and effluents from sewage, including also a chapter on utilisation and purification. London 1899. pp. xvi + 220. ill. (*Recd.* 26/3/23.) From Mr. W. Whitaker, F.R.S.

WELLS, HARRY GIDEON, DEWITT, LYDIA M., and LONG, ESMOND R. The chemistry of tuberculosis : being a compilation and critical review of existing knowledge on the chemistry of the tubercle bacillus and its products, the chemical changes and processes in the host, the chemical aspects of the treatment of tuberculosis. Baltimore 1923. pp. viii + 448. $5 net. (*Recd.* 19/3/23.)

From the Publishers : Messrs. Williams & Wilkins Company.

II. *By Purchase.*

BAGNALL-WILD, RALPH KIRKBY [and others]. Aircraft steels and materials. London 1922. pp. viii + 210. ill. 16*s*. net. (*Recd.* 19/3/23.)

FINDLAY, ALEXANDER. The phase rule and its applications. 5th edition. London 1923. pp. xvi + 298. ill. 10*s*. 6*d*. net. (*Recd.* 10/4/23.)

KREMANN, R. Die Restfeldtheorie der Valenz auf Grund der

organischen Molekülverbindungen. (Sammlung, Vol. XXVII.) Stuttgart 1923. (*Reference.*)

MITTEILUNGEN DES ÖSTERREICHISCHEN NORMENAUSSCHUSSES FÜR INDUSTRIE UND GEWERBE. Year 3, etc., Wien 1923 +. (*Reference.*)

MORGAN, SIDNEY. The preparation of plantation rubber. With a preface and a chapter on vulcanization by HENRY POTTER STEVENS. London 1922. pp. xvi + 332. ill. 21*s.* net. (*Recd.* 14/3/23.)

ORGANIC CHEMICAL REAGENTS. By ROGER ADAMS, OLIVER KAMM and CARL S. MARVEL. I. etc., Urbana, Ill. 1919 +. (*Reference.*)

RICHMOND, HENRY DROOP. Dairy chemistry : a practical handbook for dairy chemists and others having control of dairies. 3rd edition. London 1920. pp. xii + 490. ill. 25*s.* net. (*Recd.* 9/2/23.)

SABATIER, PAUL. Catalysis in organic chemistry. Translated by E. EMMET REID. New York 1922. pp. xxiv + 406. 23*s.* net. (*Recd.* 10/4/23.)

SCHWARZ, ROBERT. The chemistry of the inorganic complex compounds : an introduction to Werner's co-ordination theory. Authorized translation by LAWRENCE W. BASS. New York 1923. pp. x + 82. ill. 8*s.* 6*d.* net. (*Recd.* 22/3/23.)

STOCK, ALFRED. The structure of atoms. Translated from the 2nd German edition by SAMUEL SUGDEN. London 1923. pp. viii + 88. ill. 6*s.* net. (*Recd.* 14/3/23.)

VANINO, LUDWIG. [Editor.] Handbuch der präparativen Chemie. 2nd edition. Vol. II. Stuttgart 1923. pp. xx + 888 ill. (*Recd.* 10/4/23.)

III. *Pamphlets.*

AUSTRALIA, COMMONWEALTH OF. *Institute of Science and Industry.* Circular No. 8. New tanning materials. (Investigation by HAROLD SALT.) [Melbourne 1922.] pp. 11.

BELAIEW, NICHOLAS TIMOTHY. Sur la cristallographie de la cémentite. (From the *Congrès Scientifique International*, 1922.)

DESCH, CECIL HENRY. The services of Henry Clifton Sorby to metallurgy : being the second Sorby Lecture, delivered on Monday, October 31st, 1921. [Sheffield, n.d.] pp. 20. ill.

EDER, JOSEF MARIA. Spektralanalytische Untersuchungen zum Nachweis eines bisher unbekannten Elements der Terbiumgruppe und das Bogenspektrum des Terbiums. (From the *Sitzungsber. Akad. Wiss. Wien, Math.-naturwiss. Klasse*, 1922 [iia], **131**.)

ENNOS, FREDERICK RAINE, and SUTCLIFFE, RONALD. Determination of iron in ores and silicate rocks. (From the *Summary of Progress of the Geol. Survey*, 1921.)

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

ANNIVERSARY DINNER.

The Anniversary Dinner of the Chemical Society, to which several eminent French Chemists were invited as Guests of Honour, was held at the Hotel Cecil, Strand, on Thursday, March 22nd, 1923, at 7.30 p.m., Sir JAMES WALKER, F.R.S., President, in the Chair. The following is a list of those present :

Armstrong, E. F., *President, Society of Chemical Industry.*
Armstrong, H. E., *Past-President.*
Atkinson, H. M.
Austin, P. C.
Baker, H. B.
Baker, Mrs. H. B.
Baker, J. L.
Baker, Mrs. J. L.
Baker, Miss S.
Barr, A. J. A. W.
Bearder, E. A.
Bedson, P. P.
Belaiew, N. T.
Bonzon, L. L., *French Consul-General.*
Bowdler, A. W.
Brame, J. S. S.
Brazier, S. A.
Briggs, S. H. C.
Brown, L. N.
Brown, R. B.
Brown, Mrs. R. B.
Brown, R. G., *President, Inst. of Mining and Metallurgy.*
Bull, P. C.
Burton, T. F., *Editor, J. Soc. Chem. Ind.*
Calam, H.
Carlton, Miss M.
Carr, S. E., *Assistant Secretary.*
Chapman, A. C., *President, Institute of Chemistry.*
Clarke, F. S.
Clifford, F. W., *Librarian.*
Codd, L. W.
Cofman, V.
Cofman-Nicoresti, J.
Cofman-Nicoresti, Mrs. J.
Cohen, J. B.
Colgate, R. T.
Colgate, Mrs. R. T.
Colman, H. G.
Cooper, A. J. B.
Cooper, H. C.
Coward, H. F.
Crossley, A. W., *Foreign Secretary, Daily Telegraph.*
Desch, C. H.
Deschiens, M., *La Société de Chimie Industrielle.*
Donald, M. B.
Doolan, J. J.
Dorée, C.
Druce, J. G. F.
Dyer, B.
Egerton, A. C. G.
Egerton, Mrs. A. C. G.

Eldridge, A. A.
Eldridge, Mrs. A. A.
Ellingham, H. J. T.
Evans, E. V.
Eyre, J. V.
Finnemore, H.
Ford, S. F.
Fox, J. J.
Garner, W. E.
Gérard, J., *Secrétaire, La Société de Chimie Industrielle.*
Gibbons, W. M.
Gibson, C. S.
Gilbard, J. F. H.
Gillick, E. G.
Goldsmith, J. N.
Goldsmith, L. D.
Gosling, F.
Gray, R. W.
Gray, W. H.
Greenaway, A. J., *Joint Editor.*
Gregory, Sir R., *Editor of "Nature."*
Hale, A. J.
Henry, T. A.
Henry, Mrs. T. A.
Hepworth, H.
Hewitt, Miss A. M.
Hewitt, J. T., *Vice-President.*
Heywood, W. R.
Hinchley, J. W.
Hinchley, Mrs. J. W.
Hooper, E. G.
Hope, E.
Horton, E.
Howard, D. L.
Howard, H. L.
Hudleston, L. J.
Hulton, H. F. E.
James, T. C.
Jones, W. P.
Jones, Mrs. W. P.
Kenner, J.
Kestner, P., *Président, La Société de Chimie Industrielle.*
King, H.
Kingston, Miss H. L.
Kirby, Miss E. M.
Kon, G. A. R.
Koran, V.
Laidlaw, P. P.
Laker, J.
Laker, J., Senr.
Lamb, W.
Le Bas, Miss G.
Le Bel, J. A., *La Société Chimique de France.*
Le Chatelier, H. L., *La Société Chimique de France.*
Le Good, P.
Leitch, Miss G. C.
Le Pla, Miss M.
Le Rossignol, R.
Lessing, R.
Levy, P. J.
Lightfoot, Miss C. H.
Lowry, T. M., *Vice-President.*
McBain, J. W.
McCombie, H.
Maclean, Mrs. I. S.
Macnab, W.
Macnab, Mrs. W.
Manning, A. B.
Marlow, G. S. W.
Masson, I., *Secretary.*
Masson, Mrs. I.
Matthews, F. E.
Miall, S., *Editor, "Chemistry and Industry."*
Miall, Mrs. S.
Micklethwait, Miss F. M. G.
Micklewright, H. G. F.
Mond, E. S.
Mond, Mrs. E. S.
Moody, G. T.
Moody, Mrs. G. T.
Morgan, G. T., *Vice-President.*
Morgan, H. H.
Moritz, E. R., *President, Institute of Brewing.*
Morning Post.
Morrell, R. S.
Morris, H. J.
Nathan, Sir F. L.
Nathan, Lady.
Neathercoat, E. T., *President, Pharmaceutical Society.*
Nicklin, G. N.
Orton, K. J. P.
Paget, H.
Paget, Mrs. H.
Pentecost, S. J., *President, Society of Dyers and Colourists.*
Perkin, W. H., *Past-President.*
Perkin, Mrs. W. H.
Perry, R. G., *President, Assoc. British Chem. Mfrs.*

Philip, J. C., *Secretary.*
Philip, Mrs. J. C.
Phillips, P. P.
Pickard, R. H.
Pilley, J. J.
Plant, S. G. P.
Pope, Sir W. J., *Past-President.*
Press Association.
Price, T. S.
Prince, A. J.
Raleigh, F. V.
Reavell, J. A.
Reilly, J.
Richards, P. A. E., *President, Society of Public Analysts.*
Rideal, E. K.
Rintoul, W.
Robertson, Sir R., *President, Faraday Society.*
Robertson, Lady.
Rodd, E. H.
Roff, E. A.
Russell, A. S.
Russell, A. Scott.
Savage, E. G.
Scott, A., *Past-President.*
Scott, Mrs. A.
Sharp, T. M.
Sherrington, Sir C. S., *President, Royal Society.*
Shilling, W. G.
Sidgwick, N. V.
Sinkinson, E.
Smith, C., *Joint Editor.*
Smithells, C. J.
Spielmann, P. E.
Taylor, G.
Thomas, R. N. G.
Thomson, W.
Thorpe, J. F., *Treasurer.*
Thorpe, Mrs. J. F.
Tilden, Sir W. A., *Past-President.*
Tilden, Lady.
Times.
Topley, B.
Tripp, E. H.
Tucker, T.
Tunstall-Behrens, B.
Turner, Miss W.
Urbain, G., *La Société Chimique de France.*
Urbain, Madame.
Vanderstichele, Miss M.
Vanderstichele, Miss P.
Voelcker, E.
Voelcker, J. A.
Walker, Sir J., *President.*
Walker, Miss M. E.
Wayland, Sir W. A.
Whetham, C. D.
Whiteley, Miss M. A.
Williams, T. A.
Woolcock, W. J. U., *Gen. Manager, Assoc. British Chem. Mfrs.*
Worsley, R. R. Le G.
Wyatt, Miss A. D.
Wynne, Miss D. P.
Wynne, W. P., *President-elect.*
Yeoman, E. W.

The following Toasts were proposed :—

By The President, Sir James Walker, D.Sc., LL.D., F.R.S. :

1. "His Most Gracious Majesty the King." 2. "Their Majesties the Queen and Queen Alexandra, His Royal Highness the Prince of Wales, and other Members of the Royal Family."

By Sir Charles S. Sherrington, G.B.E., M.A., D.Sc., President of the Royal Society :—

3. "The Chemical Society, coupled with the name of The President."

By Dr. Arthur W. Crossley, C.M.G., C.B.E., D.Sc., F.R.S., Foreign Secretary of the Chemical Society :—

4. "Our French Guests, coupled with the names of Monsieur le Professeur Henri L. Le Chatelier, Foreign Member Royal Society, Honorary Fellow of the Chemical Society, representing La Société

Chimique de France; and Monsieur Paul Kestner, representing La Société de Chimie Industrielle."

By Professor W. P. Wynne, D.Sc., F.R.S., President-elect of the Chemical Society :—

5. "The Other Guests, coupled with the names of A. Chaston Chapman, Esq., F.R.S., President of the Institute of Chemistry, and Sir Richard Gregory, Editor of *Nature*."

The Loyal Toasts having been honoured, Sir Charles S. Sherrington, G.B.E., P.R.S., in proposing "The Chemical Society," said :—

Mr. President, Ladies and Gentlemen, I have the privilege, and a great privilege I esteem it, of proposing to this company to-night the toast of "The Chemical Society." That toast in any company, and least of all in this, you will agree with me, needs no commendation from me or from any others, nor can anything that I can say, I feel, enhance it further to you.

The science that this Society represents is second to none in its triumphs and in its importance to the world. And the Society has a tradition of representing that science for something over eighty years; in fact, it was on my tongue to refer to it as an old Society, but I refrained, because it is a young Society. It is a Society that can never grow old, for it is, if I may say so, already immortal. It is a Society which cultivates, and is a leader in, all the various branches of chemical science. I am well acquainted by contact with those who pursue this science, and with the purity of their researches, and yet I think those here this evening who are fellow guests with me will agree there is very good evidence that there is an applied chemistry which this Society also cultivates, a subtle chemistry that depends in part on decoctions and on distillation, and a chemistry that yields us what are sometimes known as the pleasures of the table, the very delightful table we are enjoying to-night. If I may allow myself a small play on words, it is a symbol of good taste.

An interesting feature in the history of this Society is that the first President of the Society was Thomas Graham, whom we may regard as the founder of that great and intricate and growing field of science which so much bears upon the studies of physiology. Well, chemistry is certainly a feature of life. One cannot help wondering whether life has not for its chief mechanism, and uses as its chief mechanism, chemical mechanism. If one pursues that thought, one feels at once that all that great domain of human interest, which is summed up in the two words health and disease, is fundamentally chemical, and that ultimately it is along chemical lines of research that the human intellect must

solve the problems, practical and theoretical, which attach to those two great terms.

Of the many good works that the Society does there is one that has been long a source of admiration to me, the publications of the Society. More useful or more admirable issues I know of nowhere than the Journal of the Chemical Society, with its original papers and its valued abstracts, and the Annual Reports on the Progress of Chemistry, bringing together epitomes by experts, and containing each year a mine of information to which I have been only too glad and grateful often to refer. One never dips into those volumes without being struck by the circumstance that of all sciences chemistry and, in its name, your own Society, contributes in extraordinary measure to the growth of the English language. I refer to the number of new names that appear annually, not mere trifles, but words that are sixteen and seventeen syllables long! The poet once wrote of other poets as makers of "Jewels five words long that sparkle on the forefinger of time for ever." Well, as to jewels five words long, there are good chemical words of twenty syllables, and as for literary students adding to the language with such richness I think they must hide their heads abashed.

The successes of this Society are wide. We may congratulate it on the richness of its roll of membership, and on its being the recognised rallying point for all chemists engaged and interested in pure research. This Society can with truth consider itself as the parent Society of all our chemical societies. That alone is evidence of fecundity, and when we remember that its valued and exceptional library is placed at the disposal of other chemical societies, that is public-spirited work. When I dined as a guest here two years ago, your then President mentioned in his speech a scheme of federation with the other societies concerned in chemistry. I was much impressed, too, by his sketch of the advantages which would spring from it if you were all combined into one whole. Of course I know in these times it must be difficult to launch such a scheme, but he spoke in a very convincing way of the ultimate economy that would result.

In your own home you have had in the past year a notable ceremony. I had among others the privilege to be present at the unveiling of the most artistic memorial to the Fellows of this Society who, during the war, not only gave devotedly their scientific services to the public cause, the united cause, the Allied cause, but ultimately the supreme sacrifice of life itself. That typifies, and the memorial will typify for ever, the spirit of public

service and patriotism that animates the Society, and, I am sure, ever will animate it.

I notice that among the acts of the Society has been the extending of help to our colleagues who are at present in distress in Russia—a work of fraternal good fellowship. Another exhibition of admirable co-ordination is the scheme in co-operation with the American Chemical Society and the Faraday Society to carry on jointly the "Journal of Physical Chemistry." This sets an example that I feel you are happy to be able to set.

I know, of course, that this Society has some four thousand members. Well, that is financial strength; it is at the same time much more than that, because it is an expression of the solidarity with which this Society represents chemistry throughout our land. The present occasion, this anniversary with its opportunity for renewing personal acquaintance and making fresh acquaintances, is an anniversary that has become a tradition, and a tradition that is carried on from year to year, from generation to generation, is all part, to my mind, of the important work of this Society.

Well, I must not detain you too long. If you will bear with me one moment more, I should like to add that among the admirers of this Society and its good work there is none I can assure you more cordial and sincere than that of the Society of which I have, at the present moment, the privilege of acting as Chairman. That is a venerable Society. I don't know whether you regard it as an elder sister or as an aged parent, but I can assure you that whether we may be regarded as your elder sister or as your parent, we feel justifiably proud of your existence and cordially admire your excellent management and success.

In wishing your Society continued prosperity and success, may I couple this toast with the name of your distinguished and devoted President, Sir James Walker. I believe it is a fact that he thinks nothing of travelling eight hundred miles in performing his services to you, I don't know how many times during his years of office. I should like also to wish success to your President-elect, Professor Wynne, who is to succeed him in the Chair.

Sir JAMES WALKER, in response, said :—

In responding to the toast of the Chemical Society, which has been so ably and in such flattering terms proposed by Sir Charles Sherrington, I cannot do better than adopt the excellent maxim of Bernard Shaw, "Never resist temptation," and succumb at once to the temptation which must beset every retiring President, the temptation, namely, to compare the state of his Society when he entered it with its state when he relinquishes office. It is just a

third of a century since I was elected to the Fellowship of the Chemical Society. I had then seventeen hundred fellow-members: now I have four thousand—a most gratifying enlargement of one's circle. The chief business of the Society then, as now, was to hold scientific meetings and to publish scientific memoirs. I must confess that the ordinary meetings now do not appear to me quite so interesting as they did in the early 'nineties. No doubt the change is in myself, rather than in the character of the communications. My appetite for scientific communications is probably not quite so keen as it was thirty years ago. Besides the ordinary meetings, however, we now have informal meetings to bring the Fellows more closely together, and special lectures by men eminent in their own branch of research. These innovations are altogether admirable, and are highly appreciated.

With regard to publications, the volume of our journal has greatly swollen since 1890. The membership has more than doubled, but the number of papers has increased more than fivefold. When I entered the Society it took the efforts of 24 Fellows to produce a single paper; now the labours of 11 suffice. Again, if we measure our production against the production of the world as evidenced by the number of original papers in relation to abstracts we find that it is twice as great as it was in 1890. Quantitatively, then, the progress of our Society in research is most gratifying, but what of the qualitative aspect? Well, I have recently looked through the Transactions of the first year of my Fellowship of the Society and I can say with all honesty and all confidence that in quality there is no falling off. Interests have changed, and fashions have changed, but the contributions to chemical knowledge contained in our journal have suffered no diminution of significance. They are necessarily of widely varying merit, but the average is good. The communications as a rule have no immediate or tangible practical application; they have no market value. By no alchemy can these papers be turned into gold; even the superficially easier transmutation into Treasury notes is equally impossible. They are the products of a spirit of pure scientific inquiry, and originate for the most part in the laboratories of our universities and colleges which are still the main training grounds of research.

We chemists have been often urged of late not to stick so closely to our laboratories, but to come out and play a part in public life. The advice, if sound, is applicable to only a small fraction of our number. The common chemist, the "vulgar spagirist," cannot at will assume a legislative air and proceed to fashion the nation to his own mould. I confess I do not contemplate the prospect of a general migration from Burlington House to the Houses of Parlia-

ment with contentment or even equanimity. I have sat on a good many public boards, and I frankly own that I have not observed scientific societies to be conspicuously better managed than other bodies. Were our Council multiplied twentyfold I should not greatly care to see it supersede the House of Commons. I should even hesitate, if Sir Charles Sherrington will permit me to say so, to substitute the Royal Society for the House of Lords. Of course, from time to time, we have men like Lyon Playfair, or Roscoe, whose special gifts and qualities make them acceptable to the public, and whose opinions carry great weight. These men will, I fear, never be many, but perhaps if political parties become still more numerous—I notice that in Jugo-Slavia they have now reached 32—we may in time see in Parliament a National Spagiric Party furthering the interests of chemistry, and placing its expert knowledge at the service of the nation. This seductive vision, however, may not early be realised, but meantime there is an end which all chemists may do something to promote—whether they be industrial chemists, or analytical chemists, or academic chemists, or cash chemists—namely, the amalgamation or at least the co-operation of all those societies interested in chemistry or any branch of chemistry. Our separate voices may be feeble, but if we speak together with one voice, our words will be heard and our opinions cannot be neglected.

There is still another way of making ourselves more generally known. Lord Balfour spoke the other day of the interest which the public takes in laboratories. Could this interest not be fostered by throwing open to the inspection of the public our laboratories working under ordinary conditions? If our academic laboratories were known to be visible under the conduct of members of the staff, say at a fixed hour on a certain day of the week, I feel that in the course of the year many citizens would have taken advantage of the opportunity so afforded, and thus something would be done to make the public realise the kind of work we do and what we are useful for. I make the suggestion in all seriousness.

The most memorable event of my term of office has been alluded to by Sir Charles Sherrington, the erection in our rooms through the exertions of the Harrison Memorial Committee, of an expressive and beautiful memorial to Fellows who died in the service of their country during the war, pre-eminent amongst whom was Colonel Edward Harrison. His work in devising protective measures against the deadly poison gases will never be forgotten. Another event of great significance is the collaboration of our Society with the American Chemical Society and the Faraday Society in the publication of the Journal of Physical Chemistry. This, I trust, is

only an earnest of closer relations between all the English-speaking chemical societies. For the rest we have enjoyed a period of peace and tranquillity, and I leave the Presidency in the hands of my successor, Professor Wynne, in the hope and expectation that his experience will be as pleasant as my own has been. Professor Wynne has already rendered many services to the Society in many offices. In the chief office he will render many more.

I cannot sit down without giving expression to the great gratification which I, in common with you all, feel in the presence of so many and so distinguished French colleagues. The names of Le Bel and Le Chatelier are associated with my earliest student recollections. These names had, I am afraid, in my mind come in process of time to represent almost mythological deities, and now to see their bearers sitting at this table in the flesh, so human, so fresh, and so genial, is a source of rare pleasure and content. Ladies and gentlemen, I thank you most cordially for the kind reception you have given to the toast of "The Chemical Society," proposed in such happy and such handsome terms by Sir Charles Sherrington.

Dr. ARTHUR W. CROSSLEY, C.M.G., C.B.E., F.R.S., then proposed the Toast of "Our French Guests" in the following words :—

Upon me falls this evening the honour of proposing the toast of our French guests.

I wish that it were possible for me to borrow for the occasion, and in order to do justice to it, some of that polished oratory for which our French neighbours are so justly distinguished. But as that is not practicable I must of necessity content myself with using such language as is at my command in endeavouring to convey to our guests an impression of the very sincere and genuine pleasure we are experiencing in having them with us this evening. English chemists have always had a very sincere regard and admiration for their French colleagues, an admiration which does not lessen as time advances. We chemists have, I think, sir, one great thing for which to be thankful, namely, a common meeting-ground where we can draw close together in our aims and ideals. This common meeting-ground is the search for the absolute truth regarding the substances and phenomena which we are investigating. Here there is no room for two opinions as to what is right, for though our views and interpretations of the laws which govern chemical truth may undergo slight modification as the result of experimental work in hand, the laws themselves remain as those of the Medes and Persians, unalterable. To satisfy truth is the sole endeavour of us all. And if this meeting-ground sometimes assumes, as this evening, a rather less serious aspect, this is all to the good, for it provides an opportunity of

getting to know one another as men and as individuals, in addition to our knowledge of one another as chemists. This is one of the main reasons why we welcome our guests this evening. Their names are household words to all chemists, but we are glad of this opportunity of learning something of the personalities attached to the names.

When France gave to the chemical world the immortal Lavoisier, she set herself an uncommonly high standard, but I do not think the most critical of all France's critics can with justice say that she has failed to live up to that standard. I should like to direct attention to the names of those French chemists who have honoured this Society by accepting honorary Fellowships, and in so doing I purposely omit all names appearing in our present list. The first Honorary Fellow was appointed in the year 1847 and his name was Dumas. Then followed in 1849 Boussingault, Chevreul, Gay-Lussac, Laurent, Pelouze, Regnault, Thénard; in 1851 Balard; in 1856 Wurtz; 1857 Cahours; 1860 Berthelot, Frémy, Peligot, Deville. In 1862 Pasteur, surely a great chemist, but above all things a great humane man; in 1864 Dessaignes; in 1876 Friedel; in 1883 Debray; in 1888 Boisbaudran; in 1892 Schlœsing; in 1898 Troost, Raoult, Moissan; in 1904 Becquerel; in 1908 Gautier. Surely, sir, a country which can add to the list beginning with Lavoisier the names I have just mentioned cannot be said to have lowered her standard. These are names of which the whole world of chemists has just reason to be and is proud. And what of the little constellation of chemical stars which France has sent to us this evening? I single out two as being of particular brilliance, but I do not think that this will cause any heart-burnings in the breasts of our friends, for I do so for no other reason than that I have the pleasure of coupling their names with this toast. I refer to Professor Le Chatelier and to M. Paul Kestner. We welcome Professor Le Chatelier on many grounds, but first and foremost as the honoured representative of our great sister Society, La Société Chimique de France, and we would ask Professor Le Chatelier, when he returns to France, to convey to our sister Society our warmest greetings and good wishes. We welcome Professor Le Chatelier also as a very distinguished Honorary Fellow of this Society, and as a Davy Medallist and foreign member of the Royal Society. Last, we welcome him as one of the elder brethren of the great Fellowship of Chemists. He had made chemical history when I was but a student; he has continued to make chemical history, for his researches have illumined any and all of the branches of chemistry in which he has worked, no matter

whether it be the principle of mobile equilibrium, the nature of gaseous explosions, or the setting of cements. M. Kestner we welcome in the first place as representing another great sister Society, La Société de Chimie Industrielle, which Society is also represented by its general secretary, M. Jean Gérard, and by a member of its Council, M. Maurice Deschiens. All three represent a class not very prominent in this country, namely, that of the chemical engineer. My duties a few years ago brought me into very close contact with many French chemical engineers, and I very soon learned to appreciate their skill and marked ability to adapt themselves to new or altered conditions. This country has much to learn from its neighbour in this respect. M. Kestner may be described as the ideal chemical engineer. His name is known all the world over in connection with his film evaporator, and the improvements which his skill has introduced into the sulphuric acid chamber process. Professor Le Bel we welcome as a very distinguished Honorary Fellow of this Society, and as a Davy Medallist and Foreign Member of the Royal Society. All chemists are grateful to him for his original conception of assigning to the carbon atom a tetrahedral sphere of influence, an idea which, perhaps more than any other, has been responsible for the brilliant advances which organic chemistry has made during the last forty-five years. Professor Urbain we welcome as another distinguished Honorary Fellow of this Society. His researches strike a line contrary to those of most other chemists, for he is only satisfied to have dealings with the rarest of the rare. His work on the rare earths is *the* work on the rare earths. We have also exceptional pleasure in welcoming Madame Urbain, and we are charmed to greet her as our guest this evening. If Madame Urbain is not an Honorary Fellow of this Society, she can at all events and with justice claim to be the better half of an Honorary Fellow.

Such, sir, is the little group of chemists which represents France here this evening. Surely a group worthy of France's great and best traditions. We are proud to have them with us; we shall greatly regret when the time comes to say *au revoir*. We hope that they will take away with them a pleasurable remembrance of good comradeship, as they will certainly take our earnest and sincere wishes for continued success in their life work, devoted as it is to the study of that science which we all hold so dear. I have pleasure in proposing the health of our French guests and in coupling the toast with the names of Professor Le Chatelier and M. Paul Kestner.

Professor Henry Le Chatelier, For.Mem.R.S., replied :—

Messieurs,—Au nom de la société chimique de France, je vous

remercie de l'aimable accueil que vous avez fait ce soir à ses délégués. De semblables réunions sont bien faites pour reserrer les liens de deux pays également fiers de marcher à la tête de la civilisation.

Le concours des bonnes volontés, la coopération des activités sont indispensables aux progrès de l'humanité; l'homme seul est impuissant. Mais pour produire tout son effet, il ne suffit pas que cette coordination des efforts soit réalisée à un seul instant et dans un seul pays; elle doit s'étendre dans le temps et dans l'espace. Les plus grandes découvertes scientifiques ont été la résultante d'idées développées par des générations successives de savants et des échanges de vue incessamment renouvelés entre pays voisins.

L'Angleterre et la France ont joué un rôle particulièrement important dans la création de la Science. Leur action s'est entremêlée de telle sorte qu'il est parfois difficile de fixer la part revenant à chacun de ces pays.

A ses débuts, la Science a eu une origine essentiellement philosophique. Bacon, en Angleterre, Descartes, en France, ont jeté les bases de la Science expérimentale. Lavoisier, tout imprégné des doctrines Cartésiennes, a fondé la chimie scientifique par sa découverte des deux lois de la conservation de la masse et des éléments, bientôt complétées par les lois de Dalton sur les proportions définies et les rapports simples. A leur suite, les savants définitivement fixés sur l'objet essentiel de la Science, consacrent tous leurs efforts à démêler les lois qui enchaînent inexorablement toutes les transformations du monde matériel. Gay-Lussac formule les lois de la compressibilité et de la dilatation des gaz; Faraday, celles de la décomposition électrolytique. Sadi Carnot crée la thermodynamique et Joule la complète par la découverte du principe de conservation de l'énergie. Ampère donne les lois de l'électrodynamique sur lesquelles Lord Kelvin édifie toute la science électrique moderne.

La connaissance de ces lois, en nous donnant prise sur le monde matériel, nous permet de modifier l'orientation des phénomènes naturels de façon à les asservir à nos besoins. Cela a été l'origine de l'essor inouï de l'industrie pendant le siècle qui vient de finir. Des lois de la Thermodynamique, Sir William Siemens tire le four à récupération avec lequel Martin crée une nouvelle métallurgie de l'acier. En partant des lois de Joule, le même savant imagine le four électrique au moyen duquel Moissan institue toute l'électrométallurgie. C'est un rebondissement continuel entre les découvertes des savants Anglais et Français. Chaque découverte des uns inspire de nouveaux progrès aux autres.

La Science semblait avoir trouvé sa voie définitive; il n'en était rien. Des penseurs à l'imagination ardente, désireux de s'élever

au dessus de la simple satisfaction de nos besoins matériels et sevrés de la contemplation des mystères divins par l'affaiblissement général du sentiment religieux, tournèrent leurs aspirations vers l'étude de la constitution de la matière. Des formules de constitution de Gerhardt et de l'atome insécable de Wurtz aux molécules de J. J. Thomson, d'une complexité semblable à celle du système solaire, aux mondes à quatre dimensions et aux systèmes physiques imaginaires la préoccupation a été la même, atteindre la connaissance de l'inconnaissable. Ces ambitions ont-elles été couronnées de succès ? La religion de l'Atomistique survivra-t-elle ? Sur un terrain échappant au domaine de l'expérimentation, nous devons être modestes et attendre le jugement de la postérité. Admirons cependant la poésie de ces rêves ; elle subsistera toujours ; ne lisons-nous pas encore avec plaisir la théorie du monde édifiée par Démocrite et mise en vers par Lucrèce dans le *de Natura Rerum ?*

Aujourd'hui, de nouveaux courants surgissent ; les démocraties demandent aux savants de travailler au bonheur immédiat de l'humanité, de prolonger l'action bienfaisante exercée jadis par les fondateurs de la Science expérimentale. Il est impossible de lutter contre ce mouvement d'opinion et personne ne songe à le faire. Mais, comme dans la gracieuse légende de Daphnis et Chloé, si la science et l'industrie sont disposées à s'aimer de l'amour le plus tendre, elles ne savent comment se le témoigner. La Science doit-elle revenir en arrière et se remettre simplement à l'étude des lois de la nature, ou doit-elle, comme beaucoup d'industriels le lui demandent, s'atteler à la recherche de faits nouveaux, sacrifiant ainsi la Science véritable à l'empirisme ?

Il est imprudent de vouloir prédire l'avenir. Certains symptômes indiquent cependant un retour vers les origines de la Science. Les principes d'organisation scientifique du travail de Taylor, la révolution qu'ils ont amenés dans les procédés de la construction mécanique ont jeté un jour tout nouveau sur l'utilité des principes mêmes de la méthode scientifique. La semence jetée par de grands penseurs : Bacon, Descartes, Pascal, Lavoisier, Auguste Comte, Stuart Mill, Herbert Spencer, Taine et Claude Bernard commence à porter ses fruits. Le culte de la méthode, de l'organisation se développe et tend à sortir des laboratoires de recherche. Le rôle des savants va être d'enseigner aux industriels, aux commerçants, aux politiques les moyens d'aborder scientifiquement les problèmes que posent journellement les fabrications, les échanges, l'administration. Dans la Science pure, on fait systématiquement abstraction de toutes les propriétés de la matière, sauf une, celle que l'on étudie spécialement. Dans l'industrie, au contraire, on doit prendre les phénomènes avec toute leur complexité ; les lois cherchées

s'expriment par des fonctions algébriques d'un grand nombre de variables, souvent plus d'une douzaine. On ne peut se reconnaître dans un semblable labyrinthe sans prendre la méthode scientifique comme fil d'Ariane.

Pour remplir ce rôle nouveau, la science devra redevenir philosophique. La France et l'Angleterre sont préparées à ce rôle; elles sauront travailler la main dans la main pour donner un nouveau lustre à la civilisation et assurer la paix du monde.

M. PAUL KESTNER responded :—

Mr. President, Ladies and Gentlemen, Professor Crossley and my eminent friend and master, Monsieur Henri Le Chatelier, have shown us how the history of chemistry is also the history of a close co-operation between English and French chemists. They have shown us how this co-operation has developed, through natural causes, into great friendship. This friendship of the English and French men of science in the pure and applied field is based on sure foundations. It is always good, however, to look after the foundations and see if they cannot be improved and strengthened, and such occasions as the present are very helpful to this desired end.

When we formed the Society of Applied Chemistry in France which, as President, I have the honour of representing here to-night, we had as our essential aims the gathering together of those who are interested in industrial chemistry, so that useful work might be accomplished; but—may I confess it here?—one of the main objects I, personally, had in view was to assist by all possible means the strengthening of the Anglo-French friendship.

I call, as witnesses, the many friends I have in this room, that much has already been accomplished in this way by the Société de Chimie Industrielle.

English friendship has been manifested by the invitations to this function sent to the French Societies. It has been manifested by the cordiality of your reception, and by the words which have been spoken.

French friendship has replied, and the delegation here to-night is, I believe, the largest that has attended any similar reunion.

But I also like to think, and in fact I know, that the invitation to the Société de Chimie Industrielle de France, to send a numerous delegation, is evidence of the affection of the oldest chemical society in Great Britain to the youngest of us—the very newest comer.

The Société de Chimie Industrielle is infinitely gratified. What greater encouragement could we receive, and what greater reward for the efforts we have made, than this invitation, which so greatly honours us?

I always experience a very sincere emotion when I, as a representative of a Society of Applied Chemistry, am the guest of an assembly of savants; but, to-day, by virtue of these surroundings, I experience these sentiments with special intensity. The men of science are our masters; they are our spiritual chiefs! They give themselves up to pure research which results in the prosperity of applied chemistry. Industry turns to its advantage all those laws which the men of science establish, which they often establish without any regard to their application, and simply with the intention of increasing our knowledge.

But, on the other hand, the manufacturers, and the industrial chemists, are glad that it is given to them to witness how frequently applied science has given to the pure savant an impulse or an idea which afterwards directs him in his researches.

The coincidence that the centenary of Pasteur occurs at the same time as the centenary of the discovery of racemic or paratartaric acid is worth mentioning on this occasion. This discovery was made by my great-uncle, Charles Kestner, in his works in Alsace.

An important discovery indeed it was. It aroused much attention and was the origin of remarkable work by the most prominent scientists of those days, Berzelius, Gay-Lussac, Mitscherlich, Biot, and many others.

But is this discovery, or rather is paratartaric acid, not also the seed from which twenty-five years afterwards sprang the chemical work of Pasteur, that portion of his work that dominates the whole of his career in the realm of pure chemistry, namely, his research on molecular asymmetry and the relation between this and optical activity?

The wonderful foresight and the great experimental skill of Pasteur provided the base upon which, many years later, Le Bel, my distinguished compatriot, present at this table, and Van't Hoff established the doctrine of the asymmetric carbon atom; the early work of Pasteur on the paratartaric acid obtained from the Alsatian factory in Thann thus proved the foundation of the whole great science of stereochemistry, to which my distinguished friend, Sir William Pope, has of recent years made such important contributions.

As to the biological work of Pasteur, this began at Lille, when a distiller of alcohol, Bigot, encountered difficulties in his fermentation and consulted the young Professor of the Faculty of Sciences of that town. Pasteur recognised that the troubles of the distiller were due to the presence in the vat, alongside the usual alcohol ferment, of other micro-organisms, and in particular certain bacilli

which interfered with the fermentation and reduced the yield of alcohol. Pasteur was able to show that, in addition to the alcoholic fermentation, other fermentations developed, which destroyed the sugar without forming alcohol, and he showed that each fermentation corresponded to a characteristic ferment.

The study of the diseases of silkworms which Pasteur somewhat unwillingly undertook at the desire of Dumas and the Minister of Agriculture takes us still further away from pure chemistry, and leads us more into the world of biology and the study of the causes of infectious diseases.

Thus we can see how, driven on by problems which were submitted to him by industry, Pasteur came first to make his fine discoveries in pure chemistry, and, equally driven by other problems submitted by industry, he was obliged to depart more and more from what is properly described as chemistry, and found himself finally definitely engaged in the study of biological phenomena and infectious diseases. But the whole of Pasteur's work is a logical development from the first researches made on paratartaric acid, discovered by a chemical manufacturer.

In the name of the Société de Chimie Industrielle I most heartily thank the Chemical Society for this evidence of the affection shown to our young Association. I thank the Chemical Society for the courtesy and cordiality of the welcome which they have shown us this evening. I thank you in particular, Professor Crossley, for the kind words you have spoken of us. They will touch the hearts of all members of our Association.

In conclusion, I express the hope that the Chemical Society, when it receives our invitation to our meeting this year, will respond by sending a large delegation to visit us.

Professor W. P. Wynne, D.Sc., F.R.S. (President-elect of the Chemical Society), in proposing the toast of "The Other Guests," said :—

Two years ago the Society was engaged in doing honour to several of its Presidents who had reached their jubilee as Fellows of the Society. On that occasion ladies were present for the first time, but so far as my recollection serves, no comment was made on that very welcome fact. This evening we have a number of ladies present, some of whom, while not Fellows of the Chemical Society, are sufficiently interested in the Society to give us the pleasure of their company. We thank them for their presence, which makes these gatherings so much more sociable than the austere banquets of the years before the war.

Among the other guests included in the toast there are not only the President of the Royal Society, of whose kind references

to our work you, sir, have made acknowledgment, but also the Presidents of Societies which have cultivated intensively various departments of chemistry. Many of them are Fellows of this Society, but their presence in an official capacity may perhaps be construed as evidence that the Societies they represent look forward to and desire, as does this Society, that closer co-operation which, when achieved, will enable chemistry to speak with a united voice about all cognate matters which concern the public welfare. It is a matter of history that the grouping together of the scientific societies in Burlington House was due in no small measure to the beneficent activities of the Royal Society. Such provision for science, inadequate as it now is, made an abiding impression on the public mind. The time cannot be far distant when this Society, or the Federal Council for Pure and Applied Chemistry, in the foundation of which we played so prominent a part, will press forward to a solution the most urgent problem that confronts us at the present time, namely, the provision of a central building in which all British chemical societies will be housed, and thus achieve for Chemistry what the Royal Society was so largely instrumental in accomplishing for science in general.

During the war chemistry won for itself in this country a definite measure of recognition as one of the agencies vital to the maintenance and preservation of the State; but this belated appreciation may dwindle unless we first consolidate and then improve our position while opportunity serves. One step at least has been taken in this direction since the beginning of the present year: I refer to the founding of the new journal, "Chemistry and Industry," by the joint enterprise of the Federal Council and the Society of Chemical Industry. We admire the courage and initiative which have led to this development, for the journal is intended not only to be a chemical newspaper serving purely chemical interests, but under the guidance of its versatile editor, Dr. Miall, who is here this evening, will, we hope, carry conviction to the minds of those by whom we are governed—newspaper editors first and foremost; then perhaps, with their aid, local authorities, and it may be in time Whitehall—that neglect of chemistry is incompatible with national progress.

We are glad to welcome as our guests the President of the Association of British Chemical Manufacturers. We owe the members of that Association a very great debt of gratitude for the efforts they have made not only to maintain the heavy chemical industry, but also to provide those materials in small quantities which are so indispensable to research. From our point of view as investigators, they have put

at the disposal of research laboratories something like three thousand chemical substances, many of them of a higher order of purity than could be obtained from abroad before the war. These research chemicals are indispensable for our investigations, and yet not a few are produced only in small quantities and probably without profit to those who manufacture them. It may interest the President of the Association to know that the Chemical Society has a Research Fund from which grants are made in aid of research, and it has expressed the wish that chemicals purchased out of these grants shall be of British origin so far as that is possible. If research laboratories follow this lead, it may be hoped the Association will be encouraged eventually to make us independent of foreign sources of supply.

Then we have present with us the President of the Pharmaceutical Society, whom, in view of my old association with pharmacy, I may be permitted specially to welcome. It will be noticed, however, that those who arranged the tables have not placed him next to the President of the Institute of Chemistry, so evidently they are not yet agreed about the use of the terms pharmacist and chemist. This reference to the Institute brings me back to my toast, which is that of the other guests, coupled with the names of Mr. Chaston Chapman and Sir Richard Gregory.

Mr. Chapman needs no introduction to Fellows of the Chemical Society, for not only is he one of ourselves, but as President of the Institute of Chemistry he has built truly and well on the foundation laid by his predecessors in office, so that the status of the profession of chemistry, which is the especial care of the Institute, never stood higher than now.

And of Sir Richard Gregory is it not true to say that through the journal "Nature" he so ably edits, touch is maintained with workers even in obscure fields of research? We do well to be grateful to anyone like him who by a wide outlook over the field of scientific inquiry, in these days of specialisation, enables us to follow progress made in other departments of science than our own. Sir James Walker, ladies and gentlemen, I give you the toast of "The Other Guests," coupled with the names of Mr. Chaston Chapman and Sir Richard Gregory.

Mr. CHASTON CHAPMAN, in reply, said :—

In responding to the toast of your guests to-night I find myself in a rather more difficult position than that of my distinguished friend Sir Richard Gregory, who is also, I see, to respond to this toast, for, unlike him, I am a Fellow of the Chemical Society, and have been a Fellow for a good many more years than I sometimes like to remember. Sir Richard Gregory, as a matter of fact, is

appearing before you to-night in his true colours, whereas I feel rather like the wolf of the fable disguised in the sheep's clothing. The somewhat anomalous character I am sustaining here to-night reminds me of a very old story. The story is that of an inmate of a certain lunatic asylum. On one occasion a visitor was being taken round the asylum by an attendant, and in the course of his journey he said, "That is a very interesting man over there. Who is he?" and the attendant said, "Oh! that is a very bad case of monomania. He is all right on every subject but one, but when you get near that he is hopeless." The visitor said, "I should like to have a chat with him," and he did. For a time all went well. The man seemed lucid. Something was then said, and the inmate replied, "My dear sir, I don't think you know to whom you are speaking. Do you know I am the Czar of Russia?" The visitor passed on. A year or so later the same visitor was going through the same institution, and said, "There is my old friend the Czar of Russia. I should like to have a chat with him." The same thing happened. Everything went well at first, until something was said, and then, as before, the inmate said, "Do you know who I am? I am the Emperor of China." The visitor said to the man, "But, the last time I was here you were the Czar of Russia." "Oh, yes," replied the inmate, "but that was by another mother."

Ladies and gentlemen, I have attended a great many dinners of the Chemical Society, and on all those occasions I have been happy to associate myself with the proposers of this toast in drinking the health of our guests. That was as the Czar of Russia. To-night I find myself transformed into the Emperor of China, and in that capacity I have to respond to the very same toast. Well, the "other mother" in this case is quite clearly the Institute of Chemistry, and on behalf of the Institute, which I have the honour to represent to-night, I should like to offer you an expression of our deep appreciation and our cordial thanks. The Institute is at all times happy to be associated with the Chemical Society in anything that makes for the good of chemistry, and we are only too anxious to do anything we can in co-operation with the other societies to insure that chemistry shall take that position to which it is really entitled in the councils of the nation, and that it shall be able to speak with a firmer and stronger voice than has been the case in the past. Those of your guests for whom I have the honour of responding to-night, will feel, as I do, that we have spent an exceedingly interesting evening, and a very happy one, and I am confident it would be their wish that I should offer to you on their behalf our warmest thanks for the very kindly and hospitable manner in which you have received and entertained us.

Sir RICHARD GREGORY, who also responded, said :—

It is my duty to pronounce the epilogue upon this most pleasant evening from the point of view, at any rate, of the guests of the Chemical Society. When I was asked to be one of the responders to this toast I derived a considerable amount of satisfaction from the fact that I was to be associated with Mr. Chaston Chapman in that honour. I felt in the position of the schoolboy who said that the mechanical advantage of a long pump handle was that you could get someone else to help you pump. And I have had this evening a very excellent assistant in exerting the amount of energy required to pump out to some extent the expression of our appreciation of the hospitality that has been offered to us.

I can say in the words of the announcement displayed in a French hotel, "The wines of this establishment leave the traveller nothing to hope for." We have as guests little to hope for after the generous hospitality which we have enjoyed this evening. But the formula at this late hour is for the speaker to say that he does not wish to detain the company by inflicting upon his hearers an additional amount of suffering to that to which they have been subjected.

There was once a man in the Wild West who was just about to be swung off on account of committing some act against the laws of the community. He was asked by the sheriff, when the crowd had assembled to witness the function, whether he would like to say anything for Press purposes before he was launched into the other world. He said, "No, thanks. Get on with the job." But an officious person, I think he must have been an editor, came forward and said that he would like to make a few remarks to the assembly, and the man who was about to be hanged was asked if he had any objection. His reply was, "No, not at all, only hang me first." Sometimes, ladies and gentlemen, I think the former alternative might be preferred to the latter in the case of some speakers. But I need scarcely say this does not apply to those that we have heard this evening.

In another vein, however, I may in response to what my friend Professor Wynne has been good enough to say about nature—that is, the journal "Nature"—that it also has its troubles. There was once a schoolboy who described the Press as the mouth-organ of the public. The journal I have the honour of editing tries to suppress the mouth-organ quality, yet we do occasionally get a stunt such as the announcement of a new element of atomic number 72.

My early interests were astronomical, but after thirty years' association, possibly of a superficial kind, with all the sciences, I am afraid that one loses that intensive interest which is essential for progress. And yet astronomy to-day really touches your science of

chemistry at many points. A striking illustration of the development is, I think, contained in an article which we published a few weeks ago giving an account of the plant that has been erected in the United States for the production of helium gas. This gas was first discovered in the sun in 1868 by Lockyer, and was not isolated on the earth until twenty-seven years later. It is now being produced at the rate of from forty to fifty thousand cubic feet a day in the United States, and is being compressed and stored in steel cylinders in case of future needs for airships or other purposes. This is a most remarkable development of purely scientific work—linking up the work of the astronomer and the chemist, bringing, as it were, the light of the stars and of the sun down to the earth, and using it to discover a gas for inflating purposes. There is a law in the United States at the present time that no airship shall fly over American territory unless inflated with helium gas. To think that that development should come from a source not known on the earth until twenty-seven years after it had been discovered is an inspiring sign of the value of purely scientific work.

There is only one further point to which I should like to allude, and that is the general idea of the public that science represents only engines and powers of destruction. In this twentieth century of ours and these days of modern civilisation, it is associated in the minds of the people in general with the preparation of poison gases, with high explosives, and with all that these mean for destruction. With the history of helium and other elements in mind, one would like to say that really the voice of science is not in the bomb, is not in the high explosive or in the cloud of poison gas, but in the still small voice which comes from the recesses of the chemical laboratory.

Ordinary Scientific Meeting, Thursday, May 3rd, 1923, at 8 p.m., Professor W. P. Wynne, D.Sc., F.R.S., President, in the Chair.

The President referred to the loss sustained by the Society in the death of Edward Williams Morley, on February 24th, 1923, who was elected an Honorary Fellow on May 18th, 1904.

Certificates were read for the first time in favour of :

William Norman Allison, 16, Rycroft Road, Fazakerley, Liverpool.
Percy Burgess Domone, 20, Vaughan Gardens, Ilford.
John Clarence Hogg, B.A., College House, Pennywell Road, St. John's, Newfoundland.
Victor Malwin, M.Sc.Tech., 12, Grove Street, Broughton Lane, Manchester.
Samuel Medsforth, M.Sc.Tech., A.I.C., 46, Panmuir Road, Wimbledon, S.W. 20.

Herbert Raymond Moody, A.M., Ph.D., S.B., 63, Hamilton Terrace, New York City.
Harald Nielsen, 13, Firs Avenue, Muswell Hill, N. 10.
Wilfred Alan Wightman, B.A., The University, Leeds.
George Henry Wray, 19B, Church Gate, Loughborough.

The following Certificate has been authorised by the Council for presentation to ballot under Bye-Law I (2):

Frederick William Ford, The Institute Bactériothérapique, Carouge, Geneva, Switzerland.

Messrs. E. E. Turner and E. E. Walker were elected Scrutators, and a ballot for the election of Fellows was held. The following were subsequently declared elected as Fellows:

Kundan Lal Aggarwal, M.Sc.
Sidney Hartley Bales, M.Sc., A.I.C.
Joseph Arthur Baume.
Thomas Vincent Blake.
Jyoti Prokash Bose, M.B.
Frank Arthur Boys.
Joseph Brown.
Richard Burtles, M.Sc.Tech.
Basil Elmsley Coke, O.B.E., B.A.
Ernest Alfred Coppen.
William Everard Davies.
John Dexter, B.A., B.Sc.
Hildyard John Eglinton Dobson.
Maxwell Bruce Donald, M.Sc., A.R.C.S., A.I.C.
Gordon William Dorrell, B.Sc.
Robert George Evans.
Hugh Findlay, F.I.C.
Mary Beatrice Ford, B.Sc.
Willis Alexander Gibbons, A.M., Ph.D.
George Philip Gibson, B.Sc.
Khwaja Habib Hassan, B.Sc.
Thomas Shirley Hele, M.A.
John Thomas Holden, B.Sc.
Robert Fergus Hunter.
Donald Bennett Huntingford, M.Sc., A.I.C.
Joseph Gilbert Jackson, B.Sc.
Robert Barry Johns.
William Hugh Jones, B.Sc.
Narain Das Kehar, B.Sc.
Mary Evelyn Laing, M.Sc.
Wilfrid Leslie Lamb, M.A.
Wilfrid Lawson, M.Sc., A.I.C.
Stephen Miall, LL.D., B.Sc.
Arthur Milnes Morley, B.Sc.Tech., A.I.C.
Kanwal Nain, L.M.S.
Charles Ashe Pelley.
Ronald Arthur Punter, B.Sc., A.I.C.
Ernest Avery Roff, B.Sc.
Albert Rose.
Eugene Rothstein.
Sidney Walter Saunders, B.Sc.
Victor Wallace Slater, B.Sc.
Christopher Caiger Smith, B.Sc.
Daniel Whitehead Steuart, B.Sc.
John Sunderland, B.Sc.
Harold George Turley, B.Sc.
Allan Miles Ward, B.Sc.
Charles Arthur Waters, B.Sc.
Norman Frederick Watterson, B.Sc., A.I.C.
Edward Johnson Wayne.
Edith Muriel Whincop, M.Sc.
Mahomed Yacob, M.B., B.S.

The following papers were read:

"Change of properties of substances on drying. Part II." By H. B. Baker.

"The sodium salts of phenolphthalein." By H. Bassett and P. Halton.

"The action of thiosulphates on cupric salts." By H. BASSETT and R. G. DURRANT.

"The conditions of reaction of hydrogen with sulphur. Part II. The catalytic effect of oxygen. Part III. On the mechanism of the reaction of hydrogen with sulphur and its catalysis by oxygen." By R. G. W. NORRISH and E. K. RIDEAL.

"Studies of electrovalency. Part II. Co-ordinated hydrogen." By T. M. LOWRY.

Meeting held in the Lecture Hall of the Institution of Mechanical Engineers, on Thursday, May 10th, 1923, at 8 p.m., Professor W. P. WYNNE, President, in the Chair.

Professor W. H. Perkin delivered the Baeyer Memorial Lecture. A vote of thanks to the Lecturer, proposed by Professor H. E. Armstrong, and seconded by Dr. F. D. Chattaway, was carried with acclamation, Professor Perkin making acknowledgment.

Ordinary Scientific Meeting, Thursday, May 17th, 1923, at 8 p.m., Professor W. P. WYNNE, D.Sc., F.R.S., President, in the Chair.

The following were formally admitted Fellows of the Chemical Society: F. Stanley Clarke, Ernest A. Dancaster, A. E. Goddard.

Certificates were read for the first time in favour of:

Alfred Bostock, B.Sc., School House, Lower Bebington, Birkenhead.
John Cleminson, B.Sc., Marionville, Etherley Lane, Bishop Auckland.
James Edward Corless, West Buckland School, South Molton, Devon.
Hans von Euler-Chelpin, Prof., The University, Stockholm.
Eric Hurst, B.Sc., Strathmore, Robinson Street, Chatswood, Australia.
Thomas Roger Lewis, 87, Boundary Road, Wood Green, N. 22.
Richard Arnold Shrewsbury, B.Sc., A.R.C.S., 2, Radnor Avenue, Harrow.

The meeting was then adjourned and the Informal Meeting declared open.

MEETINGS AND LECTURE.

The next Ordinary Scientific Meeting will be held on Thursday, June 7th, 1923, at 8 p.m.

On Thursday, June 14th, 1923, at **8.30 p.m.**, in the Society's Rooms, a Lecture will be delivered by Professor Charles Moureu, entitled: "Les Gaz Rares des Sources Thermales, des Grisous et Autres Gaz Naturels."

The last Ordinary Scientific Meeting this Session will be held on Thursday, June 21st, 1923, at 8 p.m., when there will be a ballot for the election of Fellows.

List of papers received between April 20th and May 17th, 1923 :

"Studies of electrovalency. Part II. Co-ordinated hydrogen." By T. M. LOWRY.

"Investigations on the dependence of rotatory power on chemical constitution. Part XX. The rational study of optical properties: Refraction a constitutive property." By H. HUNTER.

"The adsorption of the -B and -C members of the radium and thorium series by ferric hydroxide." By J. A. CRANSTON and R. HUTTON.

"The so-called pre-pressure interval in gaseous explosions." By J. D. MORGAN.

"The action of sodium hyposulphite on cupric chloride in aqueous solution." By J. B. FIRTH and J. HIGSON.

"Researches on phellandrenes. Part I." By H. G. SMITH, E. HURST, and J. READ.

"The action of sulphuryl chloride on organic substances. Part II." By T. H. DURRANS.

"Substitution in vicinal trisubstituted benzene derivatives. Part I." By W. DAVIES.

"Investigations of the chromates of thorium and the rare earths. Part I. The system: thorium oxide–chromic anhydride–water, at 25°." By H. T. S. BRITTON.

"Benzopyrylium salts of distyryl ketones. Part II. Salts and metallic complexes of 4′-dimethylamino-2-styrylbenzopyrylium." By J. S. BUCK and I. M. HEILBRON.

"The freezing-point curve for mixtures of sodium nitrate and potassium nitrate." By H. V. A. BRISCOE and W. M. MADGIN.

"γ-Oxalyl derivatives of ββ-dimethyl- and αβ-dimethylacrylic acids." By L. HIGGINBOTHAM and A. LAPWORTH.

"Substitution in the pyrazole series. Haloid derivatives of 3 : 5-dimethylpyrazole." By G. T. MORGAN and I. ACKERMAN.

"The protective action of potassium oleate in water alcohol solutions." By E. K. RIDEAL and L. L. BIRCUMSHAW.

"Effect of hydrochloric acid on the enolising action of Grignard's reagent." By V. K. BHAGWAT.

"Hydroxy-naphthoic acids. Part I." By F. A. ROYLE and J. A. SCHEDLER.

"Hydroxy-naphthoic acids. Part II." By C. BUTLER and F. A. ROYLE.

"The properties of some silver organosols." By J. K. GILES and C. S. SALMON.

"Researches on indium. Part I. Diphenyl indium chloride and phenyl indium oxide." By A. E. GODDARD.

"Notes on the quantity and properties of charcoal obtained from various kinds of Siamese woods." By G. BOSSONI.

"The polysulphides of the alkali metals. Part IV. The polysulphides of ammonium." By J. S. THOMAS and R. W. RIDING.

"The isomerism of reduced derivatives of 1 : 4-benzdiazine. Part I. The four stereoisomeric 1 : 2 : 3 : 4-tetrahydro-2 : 3-diphenyl-1 : 4-benzdiazines." By G. M. BENNETT and C. S. GIBSON.

"The isomorphism of the amides and substituted amides of dichloro- and chlorobromo-acetic acids." By P. V. MCKIE.

"Reduction of ethyl ethylidenemalonate as affected by choice of reducing agent." By L. HIGGINBOTHAM and A. LAPWORTH.

"Mixed crystals and double salts: a comparison of systems containing water, ammonium chloride, and a chloride of manganese, iron, cobalt, nickel, or copper." By A. C. D. RIVETT and F. W. J. CLENDINNEN.

"The reversibility of additive reactions. Part I. The aldol reaction." By E. H. USHERWOOD.

"Intermittent current electrolysis. Part I. The influence of intermittent current on overvoltage." By S. GLASSTONE.

"The hydrolysis of the sulphoxide and sulphone of ββ′-dichloroethyl sulphide." By A. E. CASHMORE.

"Esterification of oxalic acid." By P. K. DUTT.

"Note on the photosynthesis of amines." By O. W. SNOW and J. F. S. STONE.

CERTIFICATES OF CANDIDATES FOR ELECTION AT THE BALLOT TO BE HELD AT THE ORDINARY SCIENTIFIC MEETING ON THURSDAY, JUNE 21ST, 1923.

N.B.—The names of those who sign from "General Knowledge" are printed in *italics*.

ALLISON, WILLIAM NORMAN, 16, Rycroft Road, Fazakerley, Liverpool. British. Analytical Chemist and Technical Chemist. 1905 to 1919 with Messrs. Ayrton Saunders & Co., Ltd., Liverpool, wholesale mfg. Chemists and Druggists. From 1911 to 1919 manager of wholesale drug dept. with this firm. 1919 to 1921 senior works chemist to The Liverpool Borax Co.,

Ltd., Borax Street, Liverpool. 1921 to date, proprietor of The Fazakerley Pharmacy, 422, Longmoor Lane, Fazakerley, Liverpool. 1921 and 1922, assistant lecturer, Chemistry Dept., Holt Technical School, Higher Tranmere, Cheshire. (*Signed by*) George Tate, John Lea, George S. Irving.

Bhagwat, Vinayak Keshav, 528, Shanwar Peth, Poona City (India). Present address, College of Technology, Manchester. Hindoo, British subject. Sir Mangaldas Nathenbhai scholar of the Bombay University. (i) M.Sc. with distinction (Bombay), Moos Gold Medallist, 1919. (ii) A.I.I.Sc. (Bangalore). (iii) Joint author of (*a*) a paper on Alcoholysis (A., 1920, i, 364); (*b*) a paper on Enolisation of Carbonyl Comp. (A., 1920, i, 368). (iv) Professor of Chemistry in Baroda College (India), 1919–1921. (v) At present Research Student, College of Technology, Manchester. (*Signed by*) Frank Lee Pyman, John K. Wood, F. M. Rowe.

Bostock, Alfred, School House, Lower Bebington, nr. Birkenhead, Cheshire. British. Analytical Chemist. B.Sc. (London), 2nd Class Hons. in Chemistry. (*Signed by*) F. S. Kipping, F. C. Laxton, G. Green, B. D. Shaw, J. B. Firth, H. Baines.

Cleminson, John, Marionville, Etherley Lane, Bishop Auckland. British. Chemistry Master. B.Sc. (Durham). Trained at Armstrong College, Newcastle-upon-Tyne. 20 years' experience as a teacher. At present, Senior Chemistry Master at the County Secondary School, Chester-le-Street, Co. Durham. (*Signed by*) H. V. A. Briscoe, J. A. Smythe, P. L. Robinson.

Corless, James Edward, West Buckland Sch., South Molton, N. Devon. British. Teacher. Science Master at West Buckland School. (*Signed by*) Francis Arnall, F. H. Lowe, P. C. Haywood.

Domone, Percy Burgess, 20, Vaughan Gardens, Ilford, Essex. British. Chief Assistant to C. F. Cross (Cross & Bevan). 30 years with Messrs. Cross & Bevan and last 20 years working on cellulose investigations. (*Signed by*) C. F. Cross, E. R. Chrystall, D. R. Davey.

Euler-Chelpin, Hans von, Stockholm. Swedish. Professor of Chemistry at the University of Stockholm. "General Chemistry of the Enzymes," translated by Pope, London, 1912. Member Swedish Academy of Science, Stockholm. Member Biochemical Society, London. (*Signed by*) James Walker, E. F. Armstrong, Frederick Soddy, F. G. Donnan.

Hirst, Frederick Beaumont, "Walmore," Mackenzie St., Sharples, Bolton. British. Chemist to Bolton Co-operative Soc., Ltd. Laboratory Head and Director of Manufacturing Dept., Wholesale Drug Works. Sometime Demonstrator, Practical Chemistry, Manchester School of Pharmacy. Pharmaceutical Chemist. Fellow Worshipful Company of Spectacle Makers, London. Fellow National Association of Opticians. Freeman of the City of London. (*Signed by*) Harry Brindle, Charles Turner, Burke Rushworth.

Hogg, John Clarence, College House, Pennywell Road, St. John's, Newfoundland. English. Vice-Principal and Science Master, The Methodist College, St. John's, Newfoundland. Natural Sciences Tripos, Part I, Cambridge University. Responsible for Science (Chemistry and Physics) in Methodist College (over 600 pupils). On staff of Rugby School (Chemistry and Physics) in 1921 (Advent term). Three months' work on sugars in Chivers' Jam Factory, Histon, Cambs. Now anxious to keep in touch with progressive Chemistry. (*Signed by*) D. James Davies, William J. Pope, W. H. Mills.

Hurst, Eric, "Strathmore," Robinson St., Chatswood, S.W. Research Chemist to the Davis Gelatine (Australia), Ltd. "The Conversion of Allyl Alcohol to Glyceryl Chloro- and Bromo-hydrins," by John Read and Eric Hurst,

Trans. Chem. Soc., 1922, Vol. **121**. Two other papers have been accepted by the Chemical Society, but have not yet been published. "A Contribution to the Chemistry of the Phellandrenes," by Eric Hurst, Henry G. Smith, and John Read (read before the Royal Society of N.S.W., Nov. 1, 1922). B.Sc. (with Honours in Organic Chemistry, subjects of graduation being General Chemistry and Organic Chemistry, pure and applied). Two years post-graduate work as Demonstrator and Research assistant in Organic Chemistry Dept., University of Sydney. Also two years' experience with Messrs. Orr & Welch, 80, Hunter St., Sydney, Assayers and Analytical Chemists. (*Signed by*) Charles E. Fawsitt, George Harker, J. C. Earl, J. A. Schofield, Henry G. Smith.

KITA, GEN-ITSU, Institute of Chemical Technology, Imp. University, Kyoto, Japan. Japanese. Professor of Chemical Technology, Kyoto Imperial University, Kyoto, Japan. "Über die Enzyme des Aspergillus oryzae, Wochenschrift für Brauerie (Berlin)," **24**, 460, (1912), "Die Bedentung der technischen Auwendung des Oidium lupuli," Zeitschrift für Spiritusindustrie, **33**, 464, (1913) (*Signed by*) Masumi Chikashigé, Rokuro Nakaseko, Kotaro Shimomura, Akira Shimomura.

KOIZUMI, SHUNZO, Furukawa-cho, Sanjyo-minami, Kyoto, Japan. Japanese. Graduate student of Chemical Institute, College of Science, Kyoto Imperial University. Graduated in 1920 from Department of Chemistry, College of Science, Kyoto Imperial University, with dissertation on "Dialkyl derivatives of *p*-Phenetol Carbamide." Papers: "Electrolytic Oxidation of Alcohols. I. Isoamyi alcohol," Memoirs of the College of Science, Vol. V, No. 6, 1922. (*Signed by*) Masumi Chikashigé, Rokuro Nakaseko, Kotaro Shimomura, Akira Shimomura.

LEWIS, THOMAS ROGER, 87, Boundary Road, Wood Green, N. 2. Welsh. Analytical and Metallurgical Chemist. Very intimate association with the late D. T. Williams, F.C.S., for 25 years in joint collaboration with him in technical advice given to clients upon the merits or otherwise of industrial processes submitted to us by them, also as joint Public Analytical Chemists. (*Signed by*) G. Watson Gray, James Smith, C. Durham Garbutt.

M'CARDELL, ROBERT OSWALD, 11, Gladstone Road, Urmston, Manchester. British. Analytical and Works Chemist. 3 years Salford Technical Institute as a chemical student, instructor in gas defensive measures 1915 to 1918. Chemist at Messrs. Levensteins prior to the war. At present engaged in soap manufacture and patent scouring agents, also investigating various chemical matters in connection with laundry work, and desirous of keeping in touch with up-to-date chemical literature. (*Signed by*) Ernest Clark, B. Prentice, G. James.

MALWIN, VICTOR, 12, Grove St., Broughton Lane, Manchester. British. Textile Chemist. M.Sc.Tech. (Manchester). Full technological certificate in City and Guilds in Textile Printing. Final certificate in Cotton Dyeing. Twelve months' research at Manchester College of Technology, joint author with Julius Huebner, M.Sc.Tech., F.I.C., F.C.S., of paper on "The Action of Metallic Salts, Soap, and Starch on the Tensile and Ripping Strain" (Transactions of the Society of Chemical Industry, Feb. 23, 1923). (*Signed by*) J. Huebner, Frank Lee Pyman, Edmund Knecht.

MEDSFORTH, SAMUEL, 46, Panmuir Road, W. Wimbledon, S.W. 20. British. Research Chemist. M.Sc.Tech. (Manchester), A.I.C. Research student and demonstrator, College of Technology, Manchester. Part author of papers on "The Sulphonation of Oils," J. S. Dyers and Colourists, and "The Estimation of Acetic Anhydride." Author of "The Promotion of Catalytic

Reactions," *J.C.S.* Research Chemist at the South Metropolitan Gas Co. (*Signed by*) E. V. Evans, Edith H. Pawsey, H. Hollings.

MITCHELL, DOUGLAS STEWART, 33, Loraine Rd., Holloway, N. British. Pharmacist. I have passed the minor examination of the Pharmaceutical Society, and have studied at the Battersea Polytechnic (Chemistry and Pharmacy Dept.) and South Western Polytechnic. (*Signed by*) C. Morton, F. Arnall, J. B. Coleman.

MOODY, HERBERT RAYMOND, 63, Hamilton Terrace, New York City. Professor of Chemistry, Director of the Laboratories College of the City of New York. I have been a Professor of Chemistry for 31 years. I am a graduate of the Massachusetts Institute of Technology with the degree of S.B. (1892). A graduate of Columbia University, A.M., 1900, Ph.D., 1901. I have written two text-books and published many papers as shown in any published list under my name. My teaching is wholly with advanced students in Chem. Engineering and Research. This department has 1500 students over whom I have entire jurisdiction with the aid of a staff of twenty-five. (*Signed by*) Marston T. Bogert, L. F. Goodwin, Harold J. Roast, *W. R. Lang, J. L. McKee, Alfred E. Macintyre.*

NIELSEN, HARALD, 13, Firs Avenue, Muswell Hill, London, N. 10. Danish. Chemical engineer and gas consulting engineer (100, Victoria Street, London, S.W. 1.). Graduated at Copenhagen, 1910, designed and built gas and chemical plant, particularly nitrogen fixation plant, in this country and abroad. Am the author of many papers and articles on chemical engineering and carbonising matter: "The Ideal Absorption Tower in the Chem. Industry," "Standardisation of Chemical Stoneware," paper before the Ceramic Society of Great Britain on Chemical Stoneware and Plant, etc.; am Ass.M.I.M.E. London and Member of Danish Societies, etc. (*Signed by*) F. Mollwo Perkin, Henry Edward Aykroyd, Harold G. Colman.

NURSE, FREDERICK ALDIS, 30, Oakhill Road, Sutton, Surrey. British. Teacher. 2nd Class Honours B.Sc. (London University). Student in the Department of Chemistry at the Chelsea Polytechnic from Sept. 1918 to July 1922. (*Signed by*) J. B. Coleman, J. C. Crocker, E. H. Nurse.

OLIVER, CYRIL VERNON, 10, Hayle Road, Maidstone, Kent. British. Research Student. B.Sc., 2nd Class Honours in Chemistry, of London University. I desire to keep in touch with the modern progress of Chemistry, through the Society's publications and meetings. (*Signed by*) J. Kenyon, J. L. White, Robert H. Pickard.

PAKRASI, KALI CHARAN, Dakshineswar, Aridat P.O., Bengal. Bengali. Chem. Laby. Asstt., Govt. Test House, Alipore, Calcutta. Passed B.Sc. of the Calcutta University in 1915. (*Signed by*) R. N. Sen, N. Brodie, J. K. Adhya.

PONDER, ARTHUR OSBORNE, Montreal P.Q., Canada. British. Assistant to Vice-President, Dominion Tar and Chemical Co., Ltd., Montreal, Canada. B.A. (New Zealand), B.A. (Oxon). Formerly Lecturer of Balliol College, Oxford. (*Signed by*) H. Hartley, C. N. Hinshelwood, H. R. Raikes, J. M. Mullaly.

RANKIN, JOHN, Exeter College, Oxford. British (Scottish). Research Student in Organic Chemistry. B.Sc. (Applied Chem.), Glasgow. Diploma of the Royal Technical College, Glasgow. A.I.C. (*Signed by*) W. H. Perkin, N. V. Sidgwick, E. Hope, R. D. Haworth, H. R. Raikes.

SCOTT, HENRY RALPH CHAMPION, 5, Selwood Terrace, S. Kensington. British. Chemist and Druggist. Apprenticeship with Messrs. Hughes, of Bournemouth, 4 years. Assistant chemist with Messrs. Atkins of Bayswater,

2½ years. Assistant chemist with M. H. N. Davidge, F.C.S., Ph.C., of Shaftesbury Av., 4 years. Manager for M. Davidge, F.C.S., Ph.C., Central Pharmacy and Davidge Manufacturing, 4 years. Member of the Pharmaceutical Society of Gt. Britain. (*Signed by*) Frank Radcliffe, Samuel Gray Fenton, Leopold Louis Bacarese.

SHREWSBURY, RICHARD ARNOLD, 2, Radnor Avenue, Harrow. English. Junior chemist to manufacturing firm. A.R.C.S., B.Sc. (Lond.). (*Signed by*) James C. Philip, H. F. Harwood, M. A. Whiteley.

TROTMAN, EDWARD RUSSELL, 3, Wellington Circus, Nottingham. English. Student. B.Sc. (Hons. in Chemistry). (*Signed by*) F. S. Kipping, E. B. R. Prideaux, F. C. Laxton.

VEILLON, LOUIS, Brookside, Weston Rhyn, Salop. Swiss. Director and Works Manager, The Graesser Monsanto Chemical Works, Ltd., Ruabon, N. Wales. Diploma, Techn. Chem., Federal Polytechnic, Zurich. Ph.D. University, Zurich. Two years assistant to Prof. G. Lunge and R. Gnehm, Zurich. Formerly works manager and Vice-President, Monsanto Chemical Works, St. Louis, Mo., U.S.A. (*Signed by*) A. W. Titherley, Ernest J. Parry, Francis H. Carr.

WIGHTMAN, WILFRED ALAN, The University, Leeds. British. Demonstrator in Organic Chemistry in the University of Leeds. B.A. (Oxon.), First Class Hons., Chemistry. Position as above; also engaged in organic chemical research. (*Signed by*) J. B. Cohen, P. K. Dutt, S. Ellingworth.

WILLCOX, CYRIL MASON, 4, Worple Avenue, Wimbledon, S.W.19. British. Student of Chemistry. B.A. (Cantab), B.Sc. (Lond.). Scholar of Magdalene College, Cambridge. Preparing for Part II. Natural Science Tripos. (*Signed by*) W. J. Pope, W. H. Mills, Eric K. Rideal.

WILLIAMS, EDWIN, B.Sc. (Lond.), A.I.C., Arosfa, Risca, Mon. British. Director, The Risca Printing Works, Risca, Mon. B.Sc. London University. A.I.C. Now writing a book on "Oil and the Oil Countries." Two world tours visiting oilfields. Research Chemist to Messrs. Lewis & Tylor, Ltd., Cardiff, 1918–1923. (*Signed by*) G. R. Thompson, H. E. Cox, J. H. Canning.

WILLSON, FRANCIS GEORGE, "Langley," Westmount Road, Eltham, S.E.9. British. Research Chemist, Research Dept., Royal Arsenal, Woolwich. "Some Derivatives of Phorone," *J.C.S.*, 1913, p. 2238. "Über Keto-enol Tautomerie," *Berichte*, 1914, pp. 832 and 837. "Die Überführung Aromatische Sulphosäuren in Phenole," *Ber.*, 1914, p. 3160. Works chemist, etc., Ministry of Munitions, 1915–1918. Research chemist and works manager, Cooper Laboratory, Watford, 1919–1921. (*Signed by*) F. Fancis, J. W. McBain, M. Taylor, J. Reilly, R. C. Farmer.

WRAY, GEORGE HENRY, 19B, Church Gate, Loughborough. British. Analytical Chemist. Chief chemist, Brush Electrical Engineering Co., for past seven years, previous to that, nine years as assistant. Fellow of the Royal Microscopical Society. (*Signed by*) A. Bramley, S. F. Burford, C. W. Bailey.

A certificate has been accepted by the Council for presentation to ballot under Bye-Law I (2) in favour of the following:

FORD, FREDERICK WILLIAM, The Institute Bactériothérapique, Carouge, Geneve. British. Bacteriologist (Chemical and Pathological). Associate of the Royal Sanitary Institute. Student Associate of The Pharmaceutical Society of Great Britain. (*Signed by*) Alfred Greeves, R. H. A. Plimmer.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

BLANCHARD, ARTHUR ALPHONZO, and PHELAN, JOSEPH W. Synthetic inorganic chemistry. 3rd edition. New York 1922. pp. xiv+322. ill. 15*s.* net. (*Recd.* 19/4/23.)

From the London Publishers: Messrs. Chapman & Hall.

DAVISON, ALBERT W., and KLOOSTER, HENRY S. VAN. Laboratory manual of physical chemistry. New York 1922. pp. viii+182. ill. 10*s.* net. (*Recd.* 16/3/23.)

From the London Publishers: Messrs. Chapman & Hall.

ELLIS, CARLETON. Synthetic resins and their plastics. New York 1923. pp. 514. ill. $6 net. (*Recd.* 24/4/23.)

From the Publishers: The Chemical Catalog Company, Inc.

GREENE, JOHN ARTHUR, and PERKIN, FREDERICK MOLLWO. "Patent," smokeless and semi-smokeless fuels. London [1922]. pp. xii+116. ill. 3*s.* net. (*Recd.* 2/5/23.) From the Authors.

KAMM, OLIVER. Qualitative organic analysis: an elementary course in the identification of organic compounds. New York 1923. pp. viii+260. 12*s.* 6*d.* net. (*Recd.* 16/5/23.)

From the London Publishers: Messrs. Chapman & Hall.

KEKULE, AUGUST. Lehrbuch der organischen Chemie oder der Chemie der Kohlenstoffverbindungen. Vols. I., II., and III., pt. 1. Erlangen 1861—67. From Professor F. R. Japp.

LEWIS, GILBERT NEWTON, and RANDALL, MERLE. Thermodynamics and the free energy of chemical substances. New York 1923. pp. xxiv+654. ill. 25*s.* net. (*Recd.* 16/5/23.)

From the London Publishers: McGraw-Hill Publishing Co.

II. *By Purchase.*

AMERICAN PHYSICAL SOCIETY. The physical review: a journal of experimental physics. 2nd series. Vol. XXI., etc. Lancaster, Pa., 1923+. (*Reference.*)

ANDÉS, LOUIS EDGAR. Iron corrosion, anti-fouling and anti-corrosive paints. Translated from the German by CHARLES SALTER. 2nd English edition, revised and enlarged by HERBERT BIRTWHISTLE STOCKS. London 1918. pp. xii+296. ill. 15*s.* net. (*Recd.* 23/5/23.)

BORGMANN, EUGEN. Anleitung zur chemischen Analyse des Weines. 3rd edition. By THEODOR WILHELM FRESENIUS and LEO GRÜNHUT. München 1922. pp. xii+184. ill. (*Recd.* 17/5/23.)

BRYDEN, CHARLES L., and DICKEY, GEORGE D. A text-book of

filtration: industrial filtration and the various types of filters used. Easton, Pa., 1923. pp. x+376. ill. 27*s*. 6*d*. net. (*Recd.* 25/4/23.)

BUNBURY, HUGH MILLS. The destructive distillation of wood. London 1923. pp. xx+320. ill. 35*s*. net. (*Recd.* 16/5/23.)

JACKSON, PERCY GEORGE. Boiler feed water: a concise handbook of water for boiler feeding purposes (its effects, treatment, and analysis). 2nd edition. London 1922. pp. xii+144. ill. 5*s*. net. (*Recd.* 23/5/23.)

MURRAY, BENJAMIN LINDLEY. Standards and tests for reagent chemicals. New York 1920. pp. x+386. 18*s*. net. (*Recd.* 16/5/23.)

OSTWALD, WOLFGANG. An introduction to theoretical and applied colloid chemistry. "The world of neglected dimensions." 2nd American edition. Translated from the 8th German edition by MARTIN HENRY FISCHER. New York 1922. pp. xiv+266. ill. 12*s*. 6*d*. net. (*Recd.* 23/5/23.)

III. *Pamphlets.*

GADD, WILLIAM LAURENCE. The setting of Portland cement. (British Portland Cement Research Assoc. Pamphlet No. 1.) London 1922. pp. 35.

GENERAL ELECTRIC CO., LTD. Research laboratories. Wembley [1923]. pp. 22. ill.

GOLDSMITH, JOHN NAISH, LEWIS, SAMUEL JUDD, and TWYMAN, F. Optical methods in control and research laboratories. 2nd edition. Vol. I. London 1923. pp. iv + 56. ill.

IMPERIAL MINERAL RESOURCES BUREAU. The Mineral Industry of the British Empire and Foreign Countries. War Period. Molybdenum (1913—1919). London 1923. pp. 87.

—— —— Strontium Minerals (1913—1919.) London 1923. pp. 12.

MARSH, JAMES ERNEST. Suggestions for the prevention of the decay of building stone. Oxford 1923. pp. 20.

MIALL, STEPHEN. The problem of solution: a tavern talk between certain chymists and others. London 1923. pp. 33.

MOIR, JAMES. Colour and chemical constitution. Part XV. A systematic study of fluorescein and resorcin-benzeine. Part XVI. Further miscellaneous observations. (From the *Trans. Roy. Soc. S. Africa*, 1922, **10**.)

PUSA, AGRICULTURAL RESEARCH INSTITUTE. *Indigo Publication No.* 9. The nature of the changes occurring during the extraction of indigo from the Java plant (*Indigofera Arrecta*). By WILLIAM ALFRED DAVIS. Calcutta 1921. pp. 76.

PUSA, AGRICULTURAL RESEARCH INSTITUTE. *Indigo Publication No.* 10. Note on the deterioration of indigo seed during storing. By WILLIAM RINGROSE GELSTON ATKINS. Calcutta 1921. pp. 9.

—— *Indigo Publication No.* 11. The nature of the changes occurring in the indigo steeping vat. II. By WILLIAM ALFRED DAVIS. Calcutta 1922. pp. 81.

RAKSHIT, JITENDRA NATH. Disappearance of volumes by dissolution of substances in water. (From the *Proc. Indian Assoc. Cultivation Sci.*, 1917, 3.)

RAMSAY MEMORIAL FELLOWSHIPS TRUST. Report and accounts for the year 1st September 1921 to 31st August 1922. pp. 10.

SCIENTIFIC AND INDUSTRIAL RESEARCH, Department of. Manchester Association of Engineers. Report of the Lathe Tools Research Committee. London 1922. pp. 90. ill.

—— The cleaning and restoration of museum exhibits: second report upon investigations conducted at the British Museum. London 1923. pp. 11. ill.

SIMONSEN, JOHN LIONEL, and RAU, MADYAR GOPAL. The constituents of some Indian essential oils. Parts I—VII. (From the *Indian Forest Records*, 1922, 9.)

SINNATT, FRANK STURDY, and MCCULLOCH, ANDREW. A contribution to the study of the stone dusting of mines. (Part II.) (*Lancs. & Cheshire Coal Research Assoc.*, Bulletin No. 11). 1922. pp. 27. ill.

SODDY, FREDERICK. Cartesian economics: the bearing of physical science upon state stewardship. London 1922. pp. 32.

SOUTH AFRICA, UNION OF. *Department of Mines and Industries.* Report of the Advisory Board of Industry and Science, October 1920—December 1921. Pretoria 1922. pp. 31.

STAFFORD, H. N., and WARD, ARTHUR ROKEBY. Some data on the bio-aeration of sewage. (From the *J. Roy. Army Med. Corps*, 1922, **39**).

TANKARD, ARNOLD ROWSBY. The influence of science on human life: being the Presidential Address delivered to the Hull Chemical and Engineering Society. Hull 1922. pp. vi + 10.

UNION INTERNATIONALE DE LA CHIMIE PURE ET APPLIQUÉE. Premier rapport de la Commission Internationale des éléments chimiques. Tables internationales des isotopes et des éléments radioactifs. Paris 1923. pp. 12 + 2 tables.

WEST, CLARENCE JAY, and GILMAN, HENRY. Organomagnesium compounds in synthetic chemistry: a bibliography of the Grignard reaction, 1900—1921. (*Reprint and Circular Series of the National Research Council*, No. 24.) Washington 1922. pp. 103.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, June 7th, 1923, at 8 p.m., Professor W. P. WYNNE, D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death, of :

	Elected	Died
Vaughan Berkeley Harley	March 4th, 1897.	May 21st, 1923.
George Ward	April 21st, 1864.	April 10th, 1923.

Certificates were read for the first time in favour of :

Edward Bertram Anderson, Millhayes, Hemyock, Devon.
James Sinclair Standish Anderson, 15, Banbury Road, Oxford.
Stanley Boulter, B.A., The Oval, Oadby, Leicester.
Edward Sackett Dewing, Otley Rectory, nr. Ipswich.
Albert Thomas Fuller, B.Sc., 54, Trent Road, Brixton, S.W. 2.
Gustavus Charles Gidley, Brynmelyn College, Weston-super-Mare.
Albert Green, B.Sc., The Edward Davies Chemical Laboratories, Aberystwyth.
Digby Richard Lawson, M.A., Woodlea, Hartford, Cheshire.
Sudhindranarayan Ray, M.Sc., 19/4, Madan Mitra Lane, Calcutta.
Ernest Goulding Sharp, 52, Castle Street, Dover.
William Pearson Tervet, Waverley, Compton Park Road, Plymouth.
William Trick Thorne, 40, Canton Road, Shanghai.

The following were formally admitted Fellows of the Chemical Society: E. A. Coppen, H. J. E. Dobson, G. W. Dorell, J. T. Holden, W. J. Osborn, S. W. Saunders, and C. C. Smith.

The following papers were read :

" Investigations on the dependence of rotatory power on chemical constitution. Part XX. The rational study of optical properties. Refraction a constitutive property." By H. HUNTER.

" Researches on indium. Part I. Diphenyl indium chloride and phenyl indium oxide." By A. E. GODDARD.

" The properties of ammonium nitrate. Part VI. The reciprocal

salt pair, ammonium nitrate and potassium sulphate." By E. P. PERMAN and W. J. HOWELLS.

"Ring-chain tautomerism. Part VI. The mechanism of the keto-cyclol change in the propane series." By E. W. LANFEAR and J. F. THORPE.

"The reversibility of additive reactions. Part I. The aldol reaction." By E. H. USHERWOOD.

"Mechanism of the pinacone–pinacoline and Wagner–Meerwein transformations." By C. K. INGOLD.

"Researches on antimony. Part I. Tri-*m*-xylylstibene and its derivatives." By A. E. GODDARD.

Lecture, Thursday, June 14th, 1923, at 8.30 p.m., Professor W. P. WYNNE, D.Sc., F.R.S., President, in the Chair.

Professor Charles Moureu, President, Société Chimique de France, delivered his Lecture entitled: "Les Gaz Rares des Sources Thermales, des Grisous et Autres Gaz Naturels." A vote of thanks to the Lecturer, proposed by Professor H. E. Armstrong, and seconded by Sir William Pope, was carried with acclamation.

Ordinary Scientific Meeting, Thursday, June 21st, 1923, at 8 p.m., Professor W. P. WYNNE, D.Sc., F.R.S., President, in the Chair.

It was announced:

1. That the Council had sealed the following Address, which was presented on the occasion of the Pasteur Centenary Celebrations, May 24th to June 1st, 1923:

> "The President, Council, and general body of Fellows of the Chemical Society welcome the opportunity afforded by the celebrations of the 100th Anniversary of the birth of Louis Pasteur, of paying their homage to the memory of this great and illustrious scientist.
>
> "It is true that Pasteur played a *rôle* in life of a far wider scope, both human and intellectual, than falls to the lot of the majority of chemists; they remember, however, with pride that Pasteur was originally trained as a chemist, and that it was his peculiar combination of rare experimental skill and consummate deductive reasoning which marked him out as the founder of modern stereochemistry. His researches on the tartaric acids must always stand out as one of the most prominent milestones in the advance of the science of chemistry.
>
> "It was not till his appointment to Lille in 1854 that his

researches took up a new line leading to his fundamental discoveries in fermentation, to be rapidly followed by his investigations dealing with the diseases of silk worms, chicken cholera, anthrax, and finally the masterpiece of his scientific genius, namely, anti-rabies inoculation.

"These discoveries opened out an entirely new realm, namely, that of micro-organisms, and consequently Pasteur is rightly regarded as the founder of the science of bacteriology.

"Though one of the greatest of all experimental scientists, it was perhaps the humane side of Pasteur's character which made him so generally beloved and reverenced. His great desire to advance knowledge for the benefit of humanity surely had a rich reward in that his labours have placed the study of infectious diseases on a truly scientific basis.

"It was Lavoisier who said that the scientist, in the quiet of his laboratory and of his study, can also exercise patriotic functions: he can hope to diminish by his labours the many ills which afflict the human species, and to increase human pleasure and prosperity. And if he should only contribute, by the new methods which he may have shown, to the lengthening of the mean age of man by a few years, or even by a few days, he also may aspire to the glorious title of benefactor of humanity.

"Surely no more striking example of Lavoisier's words could be found than was exemplified by the life and work of Louis Pasteur.

"Signed on behalf of the Council of
The Chemical Society.

W. P. WYNNE, *President.*
J. F. THORPE, *Treasurer.*
JAMES C. PHILIP, } *Secretaries.*
IRVINE MASSON, }
L.S.
ARTHUR W. CROSSLEY, *Foreign Secretary.*

"Sealed in Council this Twenty-first day of June, One thousand nine hundred and twenty-three."

2. That a communication had been received from the Committee of the Van't Hoff Fund for the endowment of research in pure and applied chemistry. The amount from this fund available for distribution during 1924 is about 1400 Dutch florins.

A Committee, consisting of Professor A. F. Holleman (President), Professor S. Hoogewerff, Professor A. Smits, and Mr. J. P. Wibaut (Secretary), has been appointed to award Grants. Applications

should be sent before November 1st, 1923, by registered post to: "Het bestuur der Koninklyke Akademie van Wetenschappen; bestemd voor de Commissie van het 'Van't Hoff-fonds,' Trippenhuis, Kloveniersburgwal, te Amsterdam." Every applicant is requested to submit a detailed account of the manner in which he proposes to expend the grant and to state the reasons for which he makes his application.

Papers embodying the results of the research may be published in any journal, but acknowledgment must be made of the source of the grant. Copies of papers containing the results of the research must be forwarded to the Committee.

3. That the following letter signed by twenty Professors, Lecturers, and Assistants of the Oural University, Ekaterinbourg, had been received on the 6th June, 1923:

To the President and the Council of the Chemical Society.

We undersigned, professors, lecturers and assistants of Oural University Ekaterinbourg,—chemists, physicians, metallurgists and of other specialities, doing their work in connection with Department for Chemistry and Metallurgy, acknowledge hereby the obtaining of boots, clothing, etc., being a donation from the Chemical Society, as is stated in accompagning receipt. We send to the Chemical Society, and to all chemists of United Kingdom our best and kindest thanks for this good help in a very hard time for us and for our families.

We accepted this donation gratefully as a sign of the humanity and a confirmation, once more, of the real international character of science.

We thank also very hearthly for an exemplare of the "Journal of the Chemical Society," 1914—1920; by this rich present we became again participated to the European science, and could follow the great achievements done by chemistry and physics in U.K.

We are sorry, we can answer on your generous sympathy and help by sending only of 2 volumes of the "Proceedings of Oural University" years 1921—1923, in three exemplares, one of which we beg you to accept and to forward two others to Royal Society and to Library of the British Museum. The "Proceedings" content the papers of the various parts of science and have an index in french.

The circumstances in our country are steadily improving and we hope the "Proceedings" will be published more regularly in future. Very many of the researches done in 1914—1923 still await their turn of the print. In the hope

it will be realised in next time more quickly, we allow us to propose an unequal change of our "Proceedings" for your "Journal" years 1921, 1922, 1923, as from 1924 we hope to be able to be regular subscriptors, for our own money.

We thank also very much for your third donation—of £20 which brought for 18 of us a "red egg" for Easter, as we say in Russia.

Considering the continuous improving of the conditions we constate that the help by money or food parcels for the future time is becoming not exigent when not superflous.

With best thanks and wishes,
Yours gratefully and sincerely
(Here follow 20 signatures).

Mr. O. R. Howell was formally admitted a Fellow of the Chemical Society.

Certificates were read for the first time in favour of:

George Fearnby, 60, Duckworth Lane, Bradford.
Albert Owen Jones, B.Sc., 1, Dark Gate, Carmarthen.
William Henry Sims, 2, Churchville, Radford, Nottingham.
Frank William Witcombe, 85, Holland Road, Maidstone.

The following Certificate has been authorised by the Council for presentation to Ballot under Bye-Law I (2):

Arthur Nicholas Kerry, Jose Cubas 4725, Buenos Aires, Argentine.

Dr. R. C. Farmer and Mr. W. E. Garner were elected Scrutators, and a ballot for the election of Fellows was held. The following were subsequently declared elected as Fellows:

William Norman Allison.
Vinayak Keshav Bhagwat, M.Sc.
Alfred Bostock, B.Sc.
John Cleminson, B.Sc.
James Edward Corless.
Percy Burgess Domone.
Hans von Euler-Chelpin.
Frederick William Ford.
Frederick Beaumont Hirst.
John Clarence Hogg, B.A.
Eric Hurst, B.Sc.
Gen-Itsu Kita.
Shunzo Koizumi.
Thomas Roger Lewis.
Robert Oswald M'Cardell.
Victor Malwin, M.Sc.Tech.
Samuel Medsforth, M.Sc.Tech., A.I.C.
Douglas Stewart Mitchell.
Herbert Raymond Moody, A.M., Ph.D., S.B.
Harald Neilsen.
Frederick Aldis Nurse, B.Sc.
Cyril Vernon Oliver, B.Sc.
Kali Charan Pakrasi, B.Sc.
Arthur Osborne Ponder, B.A.
John Rankin, B.Sc., A.I.C.
Henry Ralph Champion Scott.
Richard Arnold Shrewsbury, B.Sc., A.R.C.S.
Edward Russell Trotman, B.Sc.
Louis Veillon, Ph.D.
Wilfred Alan Wightman, B.A.
Cyril Mason Willcox, B.A., B.Sc.
Edwin Williams, B.Sc., A.I.C.
Francis George Willson.
George Henry Wray.

The following papers were read :

"The constitution of the higher oxide of nickel." By O. R. HOWELL.

"The relationship of the tautomeric hydrogen theory to the theory of induced alternate polarities." By F. ALLSOP and J. KENNER.

"Electron valency theories and stereochemistry." By S. SUGDEN.

"The relative influences of water vapour and hydrogen upon the combustion of carbon monoxide–air mixtures at high pressures." By W. A. BONE, D. M. NEWITT, and D. T. A. TOWNEND.

"Metallic hydroxy-acid complexes. Part I. Cuprilactates." By I. W. WARK.

"Metallic hydroxy-acid complexes. Part II. Cuprimalates, their formation, properties, and composition." By I. W. WARK.

"Ring-chain tautomerism. Part VII. The mutarotation of the sugars." By J. W. BAKER, C. K. INGOLD, and J. F. THORPE.

LIST OF FELLOWS, 1923.

The List of Fellows for 1923 is being prepared, and changes of address received after July 31st, 1923, cannot be included therein. Fellows whose Christian names and degrees do not appear in full are particularly requested to notify the Assistant Secretary.

The List will be sent to those Fellows only who make application prior to August 31st, 1923.

REPORT OF THE INTERNATIONAL COMMITTEE ON CHEMICAL ELEMENTS.

Copies of this Report, which embodies a Table of Isotopes and a Table of the Radioactive Elements and their Constants, will be supplied to those Fellows only who make application to the Assistant Secretary before August 31st, 1923.

VACATION ARRANGEMENTS.

The Rooms of the Society will be closed for redecoration throughout the month of August, during which period the annual revision of the Library will take place.

Fellows are particularly requested to return all Library Books in their possession not later than Tuesday, July 31st.

During the two weeks September 3rd to 15th the Library will close daily at 5 p.m.

List of papers received between May 18th, 1923, and June 21st, 1923 : *

"The determination of the degree of hydration of salts by a radioactive method." By H. TERREY and V. G. JOLLY.

"Constitutional studies in the monocarboxylic acids derived from sugars. Part I. Tetramethyl galactonolactone and the structure of galactose." By J. PRYDE.

"The coupling of diazonium compounds with monoalkylated acids of the malonic and cyanoacetic series and the action of alkyl nitrites on the esters of monoalkylated cyanoacetic acids." By T. K. WALKER.

"The constitution of sulphur salicylic acid and of related substances." By A. N. MELDRUM and M. S. SHAH.

"The action of bromine on *p*-hydroxy- and *p*-methoxy-sulphonic acids." By A. N. MELDRUM and M. S. SHAH.

"The formation of derivatives of tetrahydronaphthalene from γ-phenyl fatty acids. Part III. The influence of substituents on ring closure." By A. J. ATTWOOD, A. STEVENSON, and J. F. THORPE.

"Phenols in Ajowen oil." By B. R. SOBTI and P. SINGH.

"The oxidation of sabinene with hydrogen peroxide." By G. G. HENDERSON and A. ROBERTSON.

"Sintering : its nature and cause." By R. C. SMITH.

"Surface phenomena in sucrose solutions." By R. R. BUTLER.

"Electro-deposition of chromium. Part I. Deposition from sulphate solution." By A. N. CAMPBELL.

"Studies in the anthracene series. Part V." By E. DE B. BARNETT, J. W. COOK, and M. A. MATTHEWS.

"Piperitone. Part V. The extraction of piperitone from essential oils and the racemisation of *l*-piperitone." By J. READ and H. G. SMITH.

"The refractive dispersion of *iso*eugenol." By G. THOMPSON.

"Cryoscopic measurements with nitrobenzene." By H. M. ROBERTS and C. R. BURY.

"The system ferric oxide–phosphoric acid–water; a new phosphate." By S. R. CARTER and N. H. HARTSHORNE.

"A note on the constitution of benzene. Part II." By R. FRASER.

"The preparation of *N*-derivatives in the carbazole series." By T. S. STEVENS and S. H. TUCKER.

"Catalysis. Part XXIII. Temperature coefficients of some reactions in tropical sunlight." By N. DHAR.

* This list does not include the titles of papers which have already been recorded as read at a Scientific Meeting.

"Note on the action of methyl sulphate on diphenylamine." By C. S. GIBSON and D. C. VINING.

"The absorption spectra of the vapours of various quinones." By J. E. PURVIS.

"The conversion of sabinol into thujene." By G. G. HENDERSON and A. ROBERTSON.

"Studies on the dolomite system. Part II. An investigation of the conditions of formation of dolomite." By A. E. MITCHELL.

"The low-temperature activation of hydrogen." By A. E. MITCHELL and A. L. MARSHALL.

"The isomerism of the oximes. Part XII. Hydrochlorides." By O. L. BRADY and F. P. DUNN.

"Photocatalysis. Part IV. The photochemical production of formaldehyde from carbonic acid." By E. C. C. BALY, I. M. HEILBRON, and W. F. BARKER.

"Complex formation in lead nitrate solutions. Part I. The ternary systems lead nitrate–sodium nitrate–water, and lead nitrate–potassium nitrate–water." By S. GLASSTONE and H. N. SAUNDERS.

"Electrolytic generator for pure hydrogen." By Viscount ELVEDEN and E. SINKINSON.

"The increased solubility of phenolic bodies in water on addition of a third substance." By C. R. BAILEY.

"Cryptoisomerism in the stilbene series." By N. M. CULLINANE.

"The odorous and bitter constituents of neem oil." By E. R. WATSON, N. G. CHATTERJEE, and K. C. MUKERJEE.

"Triazole compounds. Part I. Some substituted hydroxy-benzotriazoles and their methylation products." By O. L. BRADY and J. N. E. DAY.

"The estimation of alkalis in rocks by the indirect method." By F. WALKER.

"The isomeric *l*-menthyl phenylchloroacetates." By A. MCKENZIE and I. A. SMITH.

"The quinhydrone-electrode as an electrode of comparison." By S. VEILIEL.

"New halogen derivatives of camphor. Part III. $\alpha'\beta$- and $\alpha'\pi$-Dibromocamphor." By H. BURGESS and T. M. LOWRY.

"The dissociation of complex cyanides." By G. J. BURROWS.

"Resolution of the $\alpha\delta$-dihydroxy-α-methyl-δ-*iso*propyladipic acids." By T. A. HENRY and H. PAGET.

"The bromination of compounds containing the carbonyl group. Part I. The bromination of pyruvic acid." By C. F. WARD.

"The bromination of compounds containing the carbonyl grouping. Part II. The bromination of acetophenone." By C. F. WARD.

"The bromination of aliphatic acids." By B. D. SHAW.

"The action of chlorine on amines. Part I. The action of chlorine on aniline." By W. M. CUMMING and D. G. BROWN.

"The reduction of nitronaphthalenes. Part I. The reduction of α-nitronaphthalene." By W. M. CUMMING and J. K. STEEL.

"The hydroferrocyanides and hydroferricyanides of the organic bases. Part II." By W. M. CUMMING.

"Reduction products of the hydroxyanthraquinones. Part II." By J. HALL and A. G. PERKIN.

"The hydrates of potassium and lithium platinocyanides and the system potassium platinocyanide–lithium platinocyanide–water." By H. TERREY and V. G. JOLLY.

"The structure of the benzene nucleus. Part III. Synthetic formation of a bridged phase of the naphthalene nucleus. The constitution of naphthalene and anthracene." By W. A. P. CHALLENOR and C. K. INGOLD.

"The structure of the benzene nucleus. Part IV. The reactivity of bridged linkings." By C. K. INGOLD.

"The action of silica on electrolytes." By A. F. JOSEPH and J. S. HANCOCK.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

CAVEN, ROBERT MARTIN. Quantitative chemical analysis and inorganic preparations. Part I. London 1923. pp. viii + 156. ill. 3*s*. 6*d*. net. (*Recd.* 4/6/23.)

From the Publishers: Messrs. Blackie & Son.

MOORE, HARRY. A textbook of intermediate physics. London [1923]. pp. x + 824. ill. 22*s*. 6*d*. net. (*Recd.* 5/6/23.)

From the Publishers: Messrs. Methuen & Co.

RIVETT, ALBERT CHERBURY DAVID. The phase rule and the study of heterogeneous equilibria: an introductory study. Oxford 1923. pp. 204. ill. 10*s*. 6*d*. net. (*Recd.* 17/5/23.)

From the Delegates of the Clarendon Press.

SCHWARZ, ROBERT. The chemistry of the inorganic complex compounds: an introduction to Werner's co-ordination theory. Authorized translation by LAWRENCE W. BASS. New York 1923. pp. x+82. ill. 8*s*. 6*d*. net. (*Recd.* 16/5/23.)

From the London Publishers: Messrs. Chapman & Hall.

SORNET, RENÉ. La technique industrielle des parfums synthétiques. Paris 1923. pp. xii+136. 10 *fr.* net. (*Recd.* 23/5/23.)
From the Publishers: MM. Gauthier-Villars et Cie.

WERNER, EMIL ALPHONSE. The chemistry of urea: the theory of its constitution, and of the origin and mode of its formation in living organisms. London 1923. pp. xii + 212. 14*s.* net. (*Recd.* 9/6/23.) From the Publishers: Messrs. Longmans, Green & Co.

WORSNOP, B. L., and FLINT, H. T. Advanced practical physics for students. London [1923]. pp. viii+640. ill. 21*s.* net. (*Recd.* 23/4/23.) From the Publishers: Messrs. Methuen & Co.

II. *By Purchase.*

BUCHNER, GEORG. Das Ätzen der Metalle und das Färben der Metalle: Lehrbuch der Oberflächenbehandlung der Metalle und Legierungen. 3rd edition. Berlin 1922. pp. xvi + 207. ill. (*Recd.* 1/6/23.)

GRAY, FRANCIS WILLIAM. The chemistry tangle unravelled: being chemistry systematised on a new plan based on the works of Abegg, Kossel, and Langmuir. London 1923. pp. x + 148. ill. 6*s.* net. (*Recd.* 6/6/23.)

LAMB, MORRIS CHARLES. The manufacture of chrome leather. London 1923. pp. [vi] + 420. ill. 26*s.* net. (*Recd.* 26/5/23.)

PERRIN, JEAN. Atoms. 2nd English edition, translated by DALZIEL LLEWELLYN HAMMICK. London 1923. pp. xvi+232. ill. 8*s.* 6*d.* net. (*Recd.* 23/5/23.)

PILE, SEYMOUR, and JOHNSTON, REGINALD G. A tested method of laboratory organisation. London 1923. pp. xx+98. ill. 7*s.* 6*d.* net. (*Recd.* 23/5/23.)

PIPER, CHARLES V., and MORSE, WILLIAM J. The soybean. New York 1923. pp. xvi+330. ill. 20*s.* net. (*Recd.* 16/5/23.)

SADTLER, SAMUEL PHILIP, and MATOS, LOUIS J. Industrial organic chemistry. 5th edition. Philadelphia [1923]. pp. xvi, 13—692. ill. 35*s.* net. (*Recd.* 16/5/23.)

SCHULTZ, GUSTAV. Farbstofftabellen. 6th edition. Vol. I. Berlin 1923. pp. xxii+388. (*Reference.*)

STILLMAN, ALBERT L. Briquetting. Easton, Pa., 1923. pp. xii+466. ill. 33*s.* 6*d.* net. (*Recd.* 17/4/23.)

TRUSCOTT, SAMUEL JOHN. A text-book of ore dressing. London 1923. pp. xii+680. ill. 40*s.* net. (*Recd.* 16/5/23.)

WILLOWS, RICHARD SMITH, and HATSCHEK, EMIL. Surface tension and surface energy and their influence on chemical phenomena. 3rd edition. London 1923. pp. viii+136. ill. 6*s.* 6*d.* net. (*Recd.* 16/5/23.)

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, October 4th, 1923, at 8 p.m., Professor W. P. WYNNE, D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death, of:

	Elected.	Died.
John Bingley	Dec. 15th, 1881.	July 12th, 1923.
George Herbert Leader	June 18th, 1902.	Mar. 17th, 1923.
Herbert McLeod	Feb. 6th, 1868.	Oct. 1st, 1923.
Edmund Knowles Muspratt	Jan. 21st, 1869.	Sept. 1st, 1923.
Walter Tong	May 5th, 1904.	April 13th, 1923.
William George Twiney	Feb. 21st, 1907.	1923.
James Wilson	April 1st, 1875.	June 21st, 1923.

The following were formally admitted Fellows of the Chemical Society: W. B. Adam, R. F. Hunter, H. R. Procter, and A. M. Ward.

Certificates were read for the first time in favour of:

Gopaldas Dharmdas Advani, B.A., B.Sc., c/o S. J. Co-operative Society, Hyderabad, Sind, India.

Yasuhiko Asahina, Dr.Pharm., Pharmaceutical Institute, The University, Tokyo, Japan.

Ernest Edgar Aynsley, B.Sc., School House, Westmoor, Forest Hall, Newcastle-on-Tyne.

Francis Harrold Banfield, B.Sc., 40, Maryland Road, Wood Green, N. 22.

Charles Bateman, 77, Penhevad Street, Grangetown, Cardiff.

John Thomas Burdekin, B.Sc., 27, Crimicar Lane, Fulwood, Sheffield.

John Herbert Bushill, M.Sc., Ingleside, Arthur Road, Erdington, Birmingham.

Atmaram Chakravarti, B.Sc., 29, Ward Institution Street, Calcutta.

Har Sahai Chaturvedi, B.Sc., Colonel Ganj, Cawnpore.

Alfred Chick, 69, Fountain Road, Edgbaston, Birmingham.

Ginori Conti, 58, Via della Scala, Florence, Italy.

Moritz Adolf Dittmar, B.S., Ph.D., 774, Bergenline Avenue, W. New York, U.S.A.

George Thomas Randles Francis, 3, Tregarvon Road, Clapham Common, S.W. 11.

William Hans Gesell, 235, Christopher Street, Montclair, N.J., U.S.A.
Stanley Evans Francis Gooding, B.A., 5, St. Andrews Hill, Cambridge.
Frank Charles Happold, B.Sc., Ostley House, Barrow.
Francis Wood Hardy, B.Sc., Leefield House, Allerton, Bradford.
John Reader Hosking, Sefton St. Wadestown, Wellington, New Zealand.
Julian Michael Samuel Jacobs, B.Sc., 125, Goldhurst Terrace, N.W. 6.
Bennett Alexander Jacobson, 92, Jules Street, Johannesburg, S. Africa.
James Sowden Jennings, B.Sc., Worcester Villas, Godolphin Road, Helston.
William Ross Kane, B.Sc., 77, Glebe Road, Sheffield.
William Clifford Lewis, B.Sc., A.I.C., Inversnaid, Shoreham-by-Sea.
William Maw, B.Sc., 82, Holly Avenue, Newcastle-on-Tyne.
Pasupu Krishnaswami Rajamanikkam Naidu, 52, Pedariar Koil Street, Madras.
Charles Dudley Ryder, c/o Messrs. Lockwood, Magrath, Ltd., 163, Kent Street, Sydney, N.S.W.
Junzo Shinoda, Chemical Department, The University, Manchester.
Kishen Singh, B.Sc., College of Technology, Manchester.
James Muir Smith, B.Sc., 8, Hepscott Terrace, South Shields.
John George Sutherland, B.Sc., Boksburg, Transvaal, S. Africa.
Shōichi Terada, 20, Wakamiya Chō, Ushigome, Tokyo, Japan.
Arthur James Edward Thornton, 38, Battersea Park Road, S.W. 11.
Margaret Grosvenor Tomkinson, D.-ès-Sc., B.A., Chilton, Cleobury Mortimer.
Leslie Ernest Wakeford, 14, Woolstone Road, Catford, S.E. 6.
Isaac Ephraim Weber, B.Sc., 12, Claremont Road, Luton.
Donald Whitley Woodhead, B.Sc., 248, Claremont Road, Moss Side, Manchester.

The following papers were read:

"The direct union of oxygen and sulphur." By R. G. W. Norrish and E. K. Rideal.

"Note on aqueous formaldehyde solution." By W. R. Ormandy and E. C. Craven.

"The interaction of potassium tetroxide with ice and with dilute sulphuric acid." By H. Hawley and H. J. S. Sand.

"Ring-chain tautomerism. Part IX. The effect of the *cyclo*-hexane nucleus on the carbon tetrahedral angle." By E. W. Lanfear and J. F. Thorpe.

"The formation of stable β-lactones." By L. Bains and J. F. Thorpe.

Ordinary Scientific Meeting, Thursday, October 18th, 1923, at 8 p.m., Professor W. P. Wynne, D.Sc., F.R.S., President, in the Chair.

The President referred to the loss sustained by the Society through death of:

	Elected.	Died.
John Allen Harker	Dec. 7th, 1916.	Oct. 10th, 1923.
William Brewin Shuttlewood.....	April 17th, 1890.	Oct. 7th, 1923.
William Thomson	Jan. 1st, 1872.	Oct. 4th, 1923.

It was announced that arrangements had been made whereby the publication of abstracts of papers in the domain of both pure and applied chemistry will be directed as from January next by a Bureau consisting of representatives of the Chemical Society and the Society of Chemical Industry, the members nominated by the former being Dr. Irvine Masson, Professor G. T. Morgan, Professor J. F. Thorpe, Professor W. P. Wynne. The Bureau will co-opt a ninth member as Chairman, and will proceed immediately to examine the position with a view to assimilating the abstracts prepared by the two societies into a single publication. In the meantime, however,—certainly until the end of next year—no change in the present format or method of preparing the abstracts was contemplated, apart from that announced at the last meeting.

The following were formally admitted Fellows of the Chemical Society: R. G. W. Norrish and R. A. Shrewsbury.

Certificates were read for the first time in favour of:

Geoffrey Gordon Barker, B.Sc., 10, Wellington Terrace, Sutton Coldfield.
Louis Leighton Bircumshaw, B.A., M.Sc., 68, Southdown Road, West Wimbledon, S.W. 20.
Samuel Coffey, M.Sc., Ph.D., A.I.C., 6, St. Paul's Avenue, N.W. 2.
James Joseph Doolan, B.Sc., A.I.C., 46, Michael Street, Waterford.
Phani Bhusan Ganguly, M.Sc., 54, Amhurst Park, N. 16.
Frank Leslie Garton, B.A., A.I.C., 14, Craven Avenue, Ealing, W. 5.
Dwarkanath V. Gogte, B.Sc., Khamgaon, C.P., India.
Alfred Thomas Healey, 79, Pope's Avenue, Twickenham.
Cecil John May, 19, Tyndale Place, Islington, N. 1.
Henry Compton Mills, B.A., B.Sc., 25, Cape Road, Warwick.
Donald Powell, 73, Sedgeford Road, Shepherd's Bush, W. 12.
James Rushworth, 11, Smithy Carr Lane, Brighouse.
Colin Kenneth Taylor, B.A., 21, Cromwell Road, S. Kensington, S.W. 7.
Percival Elisha Turner, B.Sc., A.I.C., Bath Road, Beenham, Reading.
Oswald James Walker, B.Sc., 24, Buccleuch Place, Edinburgh.

The following Certificate has been authorised by the Council for presentation to ballot under Bye-Law I (2):

Robert Lissenborough, Sugar Works, Cawnpore.

The following papers were read:

"The chemistry of the glutaconic acids. Part XV. Three-carbon tautomerism in the *cyclo*propane series. Part II." By F. R. Goss, C. K. Ingold, and J. F. Thorpe.

"Studies of electrovalency. Part III. The catalytic activation of molecules and the reaction of ethylene and bromine." By R. G. W. Norrish.

"The preparation and properties of selenium trioxide and chloroselenic acid." By R. R. le G. Worsley and H. B. Baker.

"The chemistry of polycyclic structures in relation to their homocyclic unsaturated isomerides. Part V. Orientation in the *gem*-dimethyl*dicyclo*pentene series." By R. C. GRIMWOOD, C. K. INGOLD, and J. F. THORPE.

NOTICES.

The attention of Fellows is drawn to the following important notices:

1. The Van der Waals Memorial Lecture will be delivered by Dr. J. H. Jeans, M.A., Sec.R.S., at the Institution of Mechanical Engineers, Storey's Gate, Westminster, S.W. 1., on Thursday, November 8th, 1923, at 8 p.m.

2. A meeting of the Research Fund Committee will be held in December next. Applications for Grants, to be made on forms obtainable from the Assistant Secretary, must be received on or before Saturday, December 1st, 1923.

All persons who received Grants in December, 1922, or December of any previous year, whose accounts have not been closed by the Council, are reminded that reports must be returned by December 1st.

3. The post-card issued with the circular letter *re* Publications for 1924 on July 30th should be filled in and returned without delay.

4. All papers submitted to the Chemical Society must now be accompanied by a short *précis*—not exceeding in general 300 words—setting out the broad results of the investigations. This *précis* will be utilised in the preparation of (1) the report of any meeting at which the paper is read, and (2) an official abstract which is to appear in the volume of Abstracts subsequent to the publication of the paper in the Journal of the Society.

5. The *Journal of Physical Chemistry* will be issued monthly from January, 1924, onwards, under the joint auspices of the American Chemical Society, the Chemical Society, and the Faraday Society. The price will be $10 to the public and $8, post free, to any member of the three Societies who subscribes direct. Any Fellow desiring to become a subscriber for 1924 should forward his application, together with a remittance for $8, to the *Journal of Physical Chemistry*, Ithaca, N.Y., U.S.A., before December 1st, 1923.

List of papers received between June 22nd and October 18th, 1923: (This list does not include the titles of papers which have

been read at a Scientific Meeting, or which have appeared in the Transactions).

"Metallic hydroxy-acid complexes. Part III. The constitution of cuprimalates and analogous compounds." By I. W. WARK.

"The catalytic decomposition of hydrogen peroxide solution by carbons prepared from carbohydrates." By J. B. FIRTH and F. S. WATSON.

"Use of zinc amalgam in the evolution method for determination of sulphur in iron and steel." By T. ASHIDA.

"The oxidising properties of sulphur dioxide. Part V. Theoretical." By W. WARDLAW and N. D. SYLVESTER.

"Action of hydrazine hydrate on phenanthraquinone." By S. DUTT and N. K. SEN.

"Dyes derived from thiodiphenylamine. Part II." By B. K. SEN and S. DUTT.

"The adiabatic cooling of water and the temperature of its maximum density as a function of pressure." By N. A. PUSHIN and E. V. GREBENSHCHIKOV.

"Cholesterol and its *rôle* in the organism." By S. MINOVICI.

"Ring-chain tautomerism. Part VIII. The αββ-trisubstituted glutaric acid type." By K. C. PANDYA and J. F. THORPE.

"Inorganic complex salts. Part III. Racemisation and the stability of complex ions." By W. THOMAS and R. FRASER.

"A revision of the dissociation constant of weak inorganic acids. Part I. Boric acid." By E. B. R. PRIDEAUX and A. T. WARD.

"The bromine compounds of phenanthrene. Part II." By H. HENSTOCK.

"The action of ozonised oxygen on mercury." By V. O. J. HODGSON and H. B. BAKER.

"The accurate determination of boiling-point elevation." By K. JABLCZYNSKI and S. KON.

"The sulphonation of *p*-substituted phenylcarbamides." By J. R. SCOTT.

"Chloro-*o*-xylenols. Part I. (5-Chloro-*o*-3-xylenol)." By L. E. HINKEL.

"Chloro-*o*-xylenols. Part II. (6-Chloro-*o*-3-xylenol)." By L. E. HINKEL and W. T. COLLINS.

"Chloro-*o*-xylenols. Part III. (5-Chloro-*o*-4-xylenol)." By L. E. HINKEL and E. E. AYLING.

"A revision of the dissociation constants of weak inorganic acids. Part II. Phosphoric acid." By E. B. R. PRIDEAUX and A. T. WARD.

"Intermittent current electrolysis. Part II. Overvoltage study of the lead electrode." By S. GLASSTONE.

"The influence of catalysts on the production of potassium perchlorate by the action of heat on potassium chlorate." By W. FARMER and J. B. FIRTH.

"The condensation of aromatic aminosulphonic acids with *iso*cyanic acid, phenyl *iso*cyanate, and cyanamide." By J. R. SCOTT and J. B. COHEN.

"Phenomenon of periodicity with reference to the heteromorphism of calcium carbonate. Preliminary note." By M. COPISAROW.

"The partial pressures of sulphuric acid over concentrated aqueous solutions of the acid at high temperatures." By J. S. THOMAS and A. G. RAMSAY.

"Synthesis of substituted thianthrens. Part II." By S. KRISHNA.

"Quantitative measurements of the reactivity of the halogens in aromatic compounds." By A. H. RHEINLANDER.

"An examination of the variation in the degrees of hydrolytic dissociation of some oxime-hydrochlorides with dilution." By L. B. TANSLEY.

"Synthesis of derivatives of phenothioxin." By S. KRISHNA.

"*p*-Bromophenyltrimethylammonium perhalides." By T. H. READE.

"*p*-Iodophenyltrimethylammonium perhalides." By T. H. READE.

"Studies in nitrations. Part I. The mono-nitration of phenol." By F. ARNALL.

"Studies in nitrations. Part II. The estimation of the nitrophenols. A new method of thermal analysis." By F. ARNALL.

"Studies in nitrations. Part III. The velocity of nitration of phenol." By F. ARNALL.

"Studies in nitrations. Part IV. The quantitative preparation of some derivatives of the nitrophenols." By F. ARNALL.

"Unsaturation in some anilide derivatives of citraconic and mesaconic acids." By W. A. JOINER.

"Note on cadmium sulphide and the determination of cadmium." By A. C. G. EGERTON and F. V. RALEIGH.

"On the vapour pressure of cadmium and its alloys with zinc." By A. C. G. EGERTON and F. V. RALEIGH.

"Organic derivatives of silicon. Part XXIX. The preparation, properties, and condensation products of di-*p*-tolylsilicane-di-ol. By H. S. PINK and F. S. KIPPING.

"The reaction between *p*-dibromobenzene and magnesium." By H. S. PINK.

"Note on the reduction of *m*-methoxybenzyl bromide by hydrogen iodide." By J. B. SHOESMITH.

"On a new type of reduction–oxidation system. Part I. Cystein and glutathione." By M. DIXON and J. H. QUASTEL.

"The properties of neighbouring hydroxy-groups attached to a benzene nucleus." By R. L. ALIMCHANDANI.

"The additive formation of four-membered rings. Part II. The conditions which confer stability on the dimethinediazidines." By C. K. INGOLD and H. A. PIGGOTT.

"On the preparation of 2 : 3-, 2 : 5-, and 3 : 4-dinitrotoluenes." By H. J. PAGE and B. R. HEASMAN.

"On the nitration of *p*-dichlorobenzene." By H. J. PAGE and B. R. HEASMAN.

"The melting-point (solidus) curve for mixtures of potassium nitrate and sodium nitrate." By W. M. MADGIN and H. V. A. BRISCOE.

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From the Publishers: Messrs. Methuen & Co.

CLARK, WILLIAM MANSFIELD. The determination of hydrogen ions: an elementary treatise on the hydrogen electrode, indicator and supplementary methods with an indexed bibliography on applications. 2nd edition. Baltimore [1922, reprinted 1923.] pp. 480. ill. $5.50 net. (*Recd.* 1/9/23.)
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der Gifte für Pharmazeuten, Chemiker und Mediziner. Berlin 1923. pp. viii + 124. ill. (*Recd.* 21/7/23.)
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III. *Pamphlets.*

ALLEN, EUGENE THOMAS, and ZIES, EMANUEL GEORGE. A chemical study of the fumaroles of the Katmai region. (*Contrib.*

Tech. Papers, National Geogr. Soc., Washington. 1923. Katmai Ser. No. 2. pp. 75—155).

AUSTRALIA, COMMONWEALTH OF. *Institute of Science and Industry.* Bulletin No. 24. The production of liquid fuels from oil shale and coal in Australia. By R. E. THWAITES. Melbourne 1923. pp. 62. ill.

—— —— Bulletin No. 25. The manufacture of pulp and paper from Australian woods. By L. R. BENJAMIN. Melbourne 1923. pp. xvi + 106.

CLARK, WILLIAM MANSFIELD, and COHEN, BARNETT. Studies on oxidation–reduction. II and III. (From the *U.S. Public Health Reports*, 1923, **38**.)

COFFEY, SAMUEL. De constitutie van cantharidine. Leiden 1923. pp. x + 50. [In English.]

COHEN, BARNETT. Indicators for *p*H control of alum dosage. (From the *U.S. Public Health Reports*, 1923, **38**.)

CULLINANE, NICHOLAS MICHAEL, and JAMES, THOMAS CAMPBELL. The action of reducing agents on some polynitrodiphenylamines. (From *Aberystwyth Studies*, 1922, **4**.)

DAVIES, CECIL WHITFIELD, and JAMES, THOMAS CAMPBELL. Some reactions of tetranitroaniline. (From *Aberystwyth Studies*, 1922, **4**.)

DELACRE, MAURICE. L'enseignement de la chimie à l'Université de Gand. [Gand 1923.] pp. 26.

FREDERICK, ROBERT C. The chemical changes which occur in samples of excretally polluted water under certain specified conditions. (From the *J. Hygiene*, 1923, **21**.)

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HOWARD, STANLEY HERBERT, ROBERTSON, WHEATLEY ALEXANDER, and SIMONSEN, JOHN LIONEL. Notes on the possibilities of camphor cultivation from *Cinnamomum camphora* in Northern India. (From the *Indian Forest Records*, 1923, **9**.) ill.

IMPERIAL MINERAL RESOURCES BUREAU. The Mineral Industry of the British Empire and Foreign Countries. (War Period.) Graphite (1913—1919.) London 1923. pp. 57.

—— —— Gypsum (1913—1919). London 1923. pp. iv + 31.

INSTITUTE OF CHEMISTRY OF GREAT BRITAIN AND IRELAND. Some aspects of the law of England affecting chemists. By EVAN JAMES MACGILLIVRAY. London 1923. pp. 46.

LOMAX, J., and LOMAX, J. R. Transparent preparations of coal for microscopical investigations. (*Lancs. and Cheshire Coal Research Assoc.* Bulletin No. 14.) London 1923. pp. 24. ill.

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, November 1st, 1923, at 8 p.m., Professor W. P. WYNNE, D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death, of the following Fellows:

	Elected.	Died.
Walter Stanley Haines	Dec. 15th, 1892.	Jan. 27th, 1923.
John Edward Stead	Nov. 16th, 1882.	Oct. 31st, 1923.

The following were formally admitted Fellows of the Chemical Society: R. Child, B. W. A. Crutchlow, J. N. Dean, C. M. Willcox.

Certificates were read for the first time in favour of:

Charles Rowan Barker, 78, Liverpool Street, Paddington, Sydney, N.S.W.
The Rt. Hon. Viscount Exmouth, The Chemical Industry Club, 2, Whitehall Court, S.W. 1.
Stanley Thomas Henderson, B.A., B.Sc., 50, Cambridge Avenue, N.W. 6.
Thomas Hopkins, M.Sc., F.I.C., Glanwern, King George Avenue, Llanelly.
Francis Lions, B.Sc., 17, Lincoln Grove, Chorlton-on-Medlock, Manchester.
Henry Oates Richardson, Ashworth House, Ashworth Road, Dewsbury.
Neil Gillies Ross, Caroni Estate, Caroni, Trinidad.
Harold Roberts Stevens, B.A., 9, Panton Street, Cambridge.
Russell Gibson Thin, B.Sc., A.I.C., 2, Chalmers Crescent, Edinburgh.

The following papers were read:

"The rapid admixture of hot combustible gases with air." By F. M. GRAY and W. E. GARNER.

"The determination of surface tension from the maximum pressure in bubbles. Part II." By S. SUGDEN.

"The variation of surface tension with temperature and some related functions." By S. SUGDEN.

"Muconic and hydromuconic acids. Part III. Valency interchange in the hydromuconic system." By E. H. FARMER.

"Experiments on the synthesis of substances possessing the Ladenburg formula. Part I. Derivatives of *cyclo*propyl*cyclo*propane." By E. H. FARMER.

Meeting held in the Lecture Hall of the Institution of Mechanical Engineers, on Thursday, November 8th, 1923, at 8 p.m., Professor W. P. WYNNE, F.R.S., President, in the Chair.

Dr. J. H. JEANS, Sec.R.S., delivered the Van der Waals Memorial Lecture. A vote of thanks to the Lecturer, proposed by Professor F. G. Donnan, and seconded by Dr. N. V. Sidgwick, was carried with acclamation, Dr. Jeans making acknowledgment.

Ordinary Scientific Meeting, Thursday, November 15th, 1923, at 8 p.m., Professor W. P. WYNNE, D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death, on October 9th, 1923, of John While Alcock, who was elected a Fellow on June 16th, 1892.

The PRESIDENT made the following announcements:

1. Fellows are reminded that in accordance with the circulars issued in July and November, replies regarding the publications of the Society for 1924 should be sent in as soon as possible, and the attention of Fellows is directed to the following resolution of Council passed at its meeting on November 15th, 1923:

"That no publications of the Society other than the Journal be sent to those Fellows who have not made application by the 31st December, 1923, this period to be extended at the discretion of the Officers in the case of Fellows resident abroad."

2. The Bureau of Chemical Abstracts, which, as Fellows are aware, has been formed on the basis of agreement between the Chemical Society and the Society of Chemical Industry, has now been completely constituted as follows:

Chairman: Professor J. C. Philip.

Representatives of the Chemical Society: Dr. I. Masson, Professor G. T. Morgan, Professor J. F. Thorpe, and Professor W. P. Wynne.

Representatives of the Society of Chemical Industry: Dr. E. F. Armstrong, Mr. Julian L. Baker, Mr. E. V. Evans, and Sir William J. Pope.

The Committee has already met and is making arrangements for the issue of Abstracts for 1924 in two sections, (*a*) Pure Chemistry, and (*b*) Applied Chemistry. So far as 1924 is concerned, these sections will be practically of the same form as the Abstracts at present issued by the Chemical Society and the Society of Chemical Industry, respectively.

As the result of negotiations between the Chemical Society and the Society of Chemical Industry, it has been agreed that Members of the Society of Chemical Industry may procure the Abstracts in pure chemistry for 1924 for the sum of £1 10*s*., and, further, that Fellows of the Chemical Society can obtain *Chemistry and Industry* for 1924 for the sum of £1 and the Abstracts in applied chemistry for 1924 for the sum of £1 10*s*., or, alternatively, both these publications for 1924 for £2.

Those Fellows of the Chemical Society desiring these publications of the Society of Chemical Industry must apply direct to the Society of Chemical Industry.

3. In accordance with the Trust Deed governing the Harrison Memorial Fund, a Selection Committee consisting of the Presidents of The Chemical Society, The Institute of Chemistry, The Society of Chemical Industry, and The Pharmaceutical Society will meet shortly to consider the first award of the Harrison Memorial Prize.

The Prize, of the value of about £150, is to be awarded to the chemist of either sex, being a natural born British subject and not at the time over thirty years of age, who, in the opinion of the Selection Committee, during the previous five years has conducted the most meritorious and promising original investigations in any branch of pure or applied chemistry and published the results of those investigations in a scientific periodical or periodicals.

Provided that in the opinion of the Selection Committee there is a candidate of sufficient distinction to warrant an award of the Prize, the first award is to be made in December, 1923.

The Selection Committee is prepared to receive applications, nominations, or information as to candidates eligible for the Prize. Any such communication must be received by the President of the Chemical Society not later than Monday, 10th December, 1923.

The following were formally admitted Fellows of the Chemical Society: N. K. Adam, H. Baines, C. S. Gibson, C. S. Grace, C. K. Ingold, J. F. Thorpe, and D. C. Vining.

Certificates were read for the first time in favour of:

Wilfrid Barnard S. Bishop, B.Sc., Tamar, Miller Street, Petersham, N.S.W.
Reginald Stanley Crowle, 38, Devonshire Road, Millom.
William Murdoch Cumming, B.Sc., F.I.C., 31, Mossgiel Road, Newlands, Glasgow.
John Dall, 42, Bruntsfield Place, Edinburgh.
Philip Eggleton, B.Sc., 45, King's Road, Kingston-on-Thames.
Paul Kestner, 38, Rue Ribera, Paris-Auteuil.
Frederick Measham Lea, M.Sc., A.I.C., 31, Greenway, Uxbridge.
James Ritchie Park, B.Sc., 164, Lessingham Avenue, Tooting, S.W. 17.
Roger Laurent Felix Robert, 43, Pine Road, Didsbury, Manchester.

Max Rubin, c/o P.O. Box 1140, Johannesburg.
Alexander Smith Russell, D.Sc., 4, Moreton Road, Oxford.
Harold Schofield, St. John's College, York.
Frank Percy Walton, 121, Culverley Road, Catford, S.E. 6.

A Certificate has been authorised by the Council for presentation to ballot under Bye-Law I (2), in favour of:

Lionel O. P. Walsh, 242, Westmount Boulevard, Montreal.

The following papers were read:

"Ring-chain tautomerism. Dynamical evidence relating to the mutarotation of the sugars." By J. W. BAKER, C. K. INGOLD, and J. F. THORPE.

"An *X*-ray investigation of certain organic acid esters and other long chain compounds." By G. SHEARER.

"Certain further *X*-ray measurements of long chain compounds and a note on their interpretation." By A MÜLLER and G. SHEARER.

"The constitution of the disaccharides. Part IX. Gentiobiose: its identity with amygdalin biose." By W. N. HAWORTH and B. WYLAM.

"The constitution of raffinose." By W. N. HAWORTH, E. L. HIRST, and D. A. RUELL.

List of papers received between October 19th and November 15th, 1923. (This list does not include the titles of papers which have been read at a Scientific Meeting, or which have appeared in the Transactions.)

"Reactions at the interface of two immiscible liquids and the part played by the vapour of each. The reaction between water and benzyl chloride." By G. HARKER.

"The life period of the overvoltage compounds." By E. NEWBERY.

"Alkyl hypochlorites." By F. D. CHATTAWAY and O. G. BACKEBERG.

"The chemical constitution of bacterial pigments. Part I. The isolation of pyocyanine and the preparation of its salts." By H. MCCOMBIE and H. A. SCARBOROUGH.

"Dihydropentindole and its derivatives. Part I." By W. H. PERKIN and S. G. P. PLANT.

"Yohimbine (quebrachine). Part III. Esterification of yohimbic acid." By E. FIELD.

"Ortho-, meta-, and para-substitution in the benzene ring." By H. G. RULE.

"The saponification of methyl and ethyl formates by water, the ionisation constant of water, and the dissociation constant of formic acid." By F. Bell and W. H. Patterson.

"The reaction between copper and nitrogen peroxide." By J. R. Park and J. R. Partington.

"The composite nature of zirconium." By G. Hevesy and V. T. Jantzen.

"The decomposition of substituted carbamic chlorides by hydroxy-compounds. Part I. The reaction between methyl phenyl carbamic chloride and ethyl alcohol at different temperatures." By T. W. Price.

"A thermostat refrigerator." By K. C. D. Hickman.

"A laboratory water motor." By K. C. D. Hickman.

"Optical rotation and the polarity of groups attached to the asymmetric atom. Part I." By H. G. Rule.

"Tautomerism of amidines. Part III. The alkylation of open-chain amidines" (*continued*). By F. L. Pyman.

"The additive formation of four-membered rings. Part III. A system of nomenclature for heterocyclic four-membered rings and the formation and properties of some derivatives of β-methylenedi-imineoxide." By C. K. Ingold.

"A synthesis of *m*-opianic acid." By W. H. Perkin and F. W. Stoyle.

"Some camphoryl-urethanes and their physiological action." By H. E. Fierz-David and W. Müller.

"Studies in fluorescence spectra. Part I. Some benzenoid hydrocarbons." By J. K. Marsh.

"An improved filter-pump." By K. C. D. Hickman.

"The diffusion potentials and ionic mobilities of benzoates and salicylates compared with the corresponding values in a membrane of parchment paper." By E. B. R. Prideaux and W. E. Crooks.

"The estimation of ferrocyanides." By W. M. Cumming.

"The constitution of polysaccharides. Part VII. Esparto cellulose." By J. C. Irvine and E. L. Hirst.

"A synthetic fat containing a methylglucoside residue." By J. C. Irvine and H. S. Gilchrist.

"The condensation of mannitol with olive oil." By J. C. Irvine and H. S. Gilchrist.

"Bactericidal action of the tellurium derivatives of aliphatic β-diketones." By G. T. Morgan, E. A. Cooper, and A. W. Burtt.

"Interaction of tellurium tetrachloride and the higher β-diketones. Part I." By G. T. Morgan and H. D. K. Drew.

"Interaction of tellurium tetrachloride and the higher β-diketones. Part II." By G. T. MORGAN and R. W. THOMASON.

"Interaction of tellurium tetrachloride and the higher β-diketones. Part III." By G. T. MORGAN and E. HOLMES.

"The dependence of polarisation-overvoltage on hydroxyl and hydrogen-ion concentration. Part I. Polarisation-overvoltage of an antimony cathode in aqueous alkaline solutions." By H. J. S. SAND and E. J. WEEKS.

"Tetrachloroiodides of organic bases." By F. D. CHATTAWAY and F. L. GARTON.

"The electrolysis of potassium oleate." By G. W. F. HOLROYD and J. E. W. RHODES.

"6-Methyl-1 : 2 : 8-trimethoxyanthraquinone and 7-methyl-1 : 2 : 8-trimethoxyanthraquinone." By J. L. SIMONSEN.

"The labile nature of the halogen atom in organic compounds. Part X. The halogenation of acetylsuccinic ester." By A. K. MACBETH and D. TRAILL.

"Preparation and reactions of the dihalogendinitromethanes." By R. A. GOTTS and L. HUNTER.

"The methoxyindoles and their derivatives." By K. G. BLAIKIE and W. H. PERKIN.

"Harmine and harmaline. Part VII. A synthesis of *apo*harmine and of certain carboline and copyrine derivatives." By W. LAWSON, W. H. PERKIN, and R. ROBINSON.

"Some substitution derivatives of aurin." By C. H. SPIERS.

"Some oxidation products of β-pinene." By G. G. HENDERSON and D. CHISHOLM.

"The chlorohydrins of β-pinene." By G. G. HENDERSON and C. A. KERR.

"The relation between the glow of phosphorus and the formation of ozone." By W. E. DOWNEY.

CERTIFICATES OF CANDIDATES FOR ELECTION AT THE BALLOT TO BE HELD AT THE ORDINARY SCIENTIFIC MEETING ON THURSDAY, DECEMBER 6TH, 1923.

N.B.—The names of those who sign from "General Knowledge" are printed in *italics*.

ADVANI, GOPALDAS DHARMDAS, c/o S. J. Co-operative Society, Hyderabad (Sind), India. Lecturer. B.A., B.Sc. (Bomb.), A.I.I.Sc. Worked with Dr. J. J. Sudborough of the Indian Institute of Science, Bangalore, on the esterification of polymethylene monocarboxylic acids and corresponding open-chain acids; published a paper on the above in the Journal of the

Indian Institute of Science. (*Signed by*) H. E. Watson, Gilbert J. Fowler Fred Marsden, M. O. Forster, *F. L. Usher.*

ANDERSON, EDWARD BERTRAM, Millhayes, Hemyock, Devon. British. Inside manager and control chemist to Dried Milk Dairy Products, Co., Ltd., Hemyock, Devon. 7 Years research chemist to John Power & Sons, Ltd., John's Lane Distillery, Dublin; 2½ years chemist, nitroglycerine section, Royal Gunpowder Factory, Waltham Abbey; 5 years chemist, Technical Research Dept., British Dyestuffs Corporation, Blackley, Manchester. (*Signed by*) Leslie H. Lampitt, E. H. Rodd, C. Hollins.

ANDERSON, JAMES SINCLAIR STANDISH, 15, Banbury Road, Oxford. Research Student. Engaged in research at the Dyson Perrins Laboratories under Professor W. H. Perkin. (*Signed by*) W. H. Perkin, E. Hope, N. V. Sidgwick, S. G. P. Plant, W. Davies, A. F. Titley.

ASAHINA, YASUHIKO, Pharmaceutical Institute, University, Tokyo. Japanese. Professor of Pharmaceutical Chemistry. Yakugakuhakushi (Doctor of Pharmacy), Dr. Pharm., Tokyo University. (*Signed by*) George Barger, James C. Philip, Robert Robinson.

AYNSLEY, ERNEST EDGAR, B.Sc., School House, Westmoor, Forest Hall, Newcastle. English. Post-graduate Student. B.Sc. of Armstrong College, University of Durham; 1st Class Honours in Chemistry. (*Signed by*) W. N. Haworth, G. C. Leitch, H. V. A. Briscoe.

BANFIELD, FRANCIS HARROLD, B.Sc., 40, Maryland Road, Wood Green, London, N. 22. British. Research worker in Organic Chemistry. B.Sc., 1st Class Hons. Chemistry, London University. I desire through the medium of the Society's Journal to keep in touch with the trend of modern research work. (*Signed by*) Robert H. Pickard, J. Kenyon, F. C. Ray, A. Houssa.

BARKER, CHARLES ROWAN, 78, Liverpool Street, Paddington, Sydney, N.S.W. British. Assistant Chemist, Dept. Agriculture, Sydney, New South Wales. 20 Years Assistant Chemist, Dept. Agriculture, N.S.W. (*Signed by*) G. P. Darnell-Smith, W. M. Doherty, R. Grant.

BARKER, GEOFFREY GORDON, 10, Wellington Terrace, Sutton Coldfield. British. Technical Assistant to Messrs. George Barker & Brettell, Chartered Patent Agents, Birmingham. B.Sc., 2nd Class Honours, Birmingham, Chemistry principal subject. (*Signed by*) Chas. E. Wood, A. E. Goddard, W. J. Hickinbottom, H. D. K. Drew, E. Holmes.

BATEMAN, CHARLES, 77, Penhwad Street, Grangetown, Cardiff. British. Gas Engineer. Assistant engineer to the Cardiff Gas Light & Coke Co. Honours Certificate in gas manufacture. Student member of the Institute of Gas Engineers. (*Signed by*) J. H. Canning, Harold M. Royle, T. V. Blake.

BIRCUMSHAW, LOUIS LEIGHTON, 68, Southdown Road, West Wimbledon, S.W. 20. English. Physical Chemist. B.A. (Cambridge) by Research; M.Sc. (London). Engaged in research in Physical Chemistry at the National Physical Laboratory, Teddington. Contributions to *J.C.S.*, Trans, **122**, CII, 887; Trans. **123**, XI, 91; Trans. **123** CLXXV, 1566. (*Signed by*) T. M. Lowry, Ulick R. Evans, Eric K. Rideal, R. G. W. Norrish, Guy Barr.

BOULTER, STANLEY, B.A., The Oval, Oadby, Leicester. Chemistry Master, King William's College, I.O.M. Final Honour School of Natural Science (Shortened Course), 1921. Research work in Organic Chemistry, 1921—1923. (*Signed by*) S. G. P. Plant, Thos. H. Durrans, G. R. Clemo, Fredk. A. Mason, E. H. Stenning, E. Hope.

BURDEKIN, JOHN THOMAS, 27, Crimicar Lane, Fulwood, Sheffield. British. At present I have no occupation. I hope to become a works or research chemist. Entered Sheffield University with a Town Trust Scholarship in

Chemistry, Physics, and French. Student of Chemistry for three years at Sheffield University. Degree of B.Sc. (2nd Class Hons.) of that Institution. Wish to keep in touch with modern research in chemistry. (*Signed by*) W. P. Wynne, J. Kenner, F. G. Tryhorn, Thos. B. Smith, G. H. Christie.

BUSHILL, JOHN HERBERT, M.Sc., "Ingleside," Arthur Road, Erdington, Birmingham. British. Assistant Chemist, J. Lyons & Co. Joint author with Prof. Ling of "The estimation of calcium in blood," *Biochemical Journal*, 1922, and author of "The estimation of ethyl alcohol and of acetone in mixtures of the two" in the *Journal of the Society of Chemical Industry*, 1923. Student at Birmingham University, 1919—1923. (*Signed by*) Arthur R. Ling, Leslie H. Lampitt, G. T. Morgan, S. R. Carter, Wm. Wardlaw, C. E. Wood.

CHAKRAVARTI, ATMARAM, 29, Ward Institution St., Calcutta. Bengalee Hindu. Analytical Chemist, Messrs. Shaw, Wallace, & Co., Calcutta. B.Sc. Calcutta University, with Chemistry as one of his subjects. At present working as Analytical Chemist and has to do a lot of Soil and Manure analyses. (*Signed by*) T. K. Ghose, J. B. Bhaduri, V. G. Dani.

CHATURVEDI, HAR SAHAI, Colonelganj, Cawnpore, U.P., India. Indian (Vedic Hinduism). Research Student. Govt. Technological Institute, Cawnpore, India. B.Sc., Allahabad University. Desirous to remain in touch with the latest chemical research. (*Signed by*) N. G. Chatterji, S. C. Banerji, N. R. Dhar.

CHICK, ALFRED, 69, Fountain Rd., Edgbaston, Birmingham. British. Analytical Chemist. Have studied Chemistry (Inorganic and Organic) and particularly the manufacture of dyestuffs. Was for 3 years articled pupil to Mr. Lones, F.I.C., Public Analyst and Consulting Chemist. Now hold appointment as chemist to the City of Birmingham Corp. Electric Supply Dept. (4 years). Have carried out research on certain intermediates for dyestuffs, but have not yet completed same. (*Signed by*) J. H. Wood, Thos. J. Murray, Arthur Adams, Joseph Lones.

COFFEY, SAMUEL, 6, St. Paul's Avenue, N.W. 2. British. Ramsay Memorial Fellow at University College, London. Research work for four years. M.Sc. (Lond.), Ph.D. (Leyden), A.I.C. Published numerous papers in Transactions on various subjects. Also in *Rec. trav. chim.* At present I am doing research work at University College, London. (*Signed by*) O. L. Brady, J. N. Collie, J. N. E. Day.

CONTI, GINORI, PRINCE PIERO, Senator of the Italian Kingdom, 58, Via della Scala, Florence, Italy. Chairman and General Manager of the Societa Boracifera di Larderello (Florence). (*Signed by*) William J. Pope, W. H. Mills, F. G. Mann.

DEWING, EDWARD SACKETT, Otley Rectory, near Ipswich. British. Research Student, Cambridge University. Researching in Organic Chemistry. Assistant demonstrator in Chemistry and in Mineralogy, Cambridge University. (*Signed by*) W. J. Pope, C. T. Heycock, W. H. Mills.

DITTMAR, MORITZ ADOLF, 774, Bergenline Avenue, West New York, New Jersey. American citizen. Director of Laboratory of Lehn and Fink, Bloomfield, New Jersey. B.Sc. in Pharmacy, Columbia University, 1920. Ph.D., University of Berne, 1922. Thesis: "Chemistry of the Phlobaphenes." (*Signed by*) H. V. Arny, Thomas J. Keenan, Virgil Coblentz.

DOOLAN, JAMES JOSEPH, 46, Michael St., Waterford. British. Chemical Research. 1st Class Honours at B.Sc. (Lond.), 1921, in Chemistry. Associate of the Institute of Chemistry, by examination. Science Master, Waterford Technical Institute, Jan. 1915—Oct. 1920. Now engaged in post-graduate

work at East London College, under the direction of Professor J. R. Partington, M.B.E., D.Sc. (*Signed by*) J. R. Partington, A. J. Prince, W. G. Shilling.

EXMOUTH, THE RT. HON. VISCOUNT, Chemical Industry Club, 2, Whitehall Court, S.W. British. Late Professor of Chemistry at Columbia University, U.S.A. (*Signed by*) W. P. Wynne, Irvine Masson, James C. Philip.

FEARNLEY, GEORGE, 60, Duckworth Lane, Bradford. English. Assistant to Consulting Technical Chemist. Conversant with the chemical analysis of textile materials, as used in the West Riding of Yorkshire. (*Signed by*) Robt. D. Abell, T. W. Price, Barker North.

FRANCIS, GEORGE THOMAS RANDLES, 3, Tregarvon Rd., North Side, Clapham Common, S.W. 11. British. Chemist. Qualified Chemist and Druggist. Privately taught in Chemistry by A. Evans, Esq., B.Sc. Science Master, County Schools, Wrexham. Received tuition at Westminster College of Chemistry, 190, Clapham Rd., S.W. 9. (1919—1920). Attended technical classes in Wolverhampton, 1913—1914. (*Signed by*) Alfred Thomas, J. S. Wilkes, P. H. Woodnoth.

FULLER, ALBERT THOMAS, 54, Trent Road, Brixton, S.W. 2. British (born in London). Chemical Research Student. 1st Class Honours Chemistry, B.Sc. (London), 1921. 18 Months Chemical Research at Battersea Polytechnic (part of Ph.D. course for which he has registered). (*Signed by*) Robert H. Pickard, J. Kenyon, Harold Hunter.

GANGULY, PHANI BHUSAN, Allahabad (India), (present address, 54, Amhurst Park, N. 16). Indian. Research Student, University College, London. Publications: "Coagulation of manganese dioxide sol by different electrolytes," Ganguly and Dhar (*Journ. Phys. Chem.*, **26**, 701—714, 1922). "Adsorption of ions by freshly precipitated manganese dioxide" (*ibid.* **26**, 836—844, 1922); "Kolloidflockung durch Sonnenlicht" (*Koll. Zeit.*, xxxi, 1922); "Beobachtungen über Wirkungen der oberflachenspannung" (Ganguly and Banerji, *Zeit. anorg. und allgemaine Chemie*, **124**, 1922). M.Sc. (1st Class, first), University of Allahabad, India. (*Signed by*) F. G. Donnan, W. E. Garner, A. E. Mitchell.

GARTON, FRANK LESLIE, 14, Craven Avenue, Ealing, London, W. 5. British. Assistant Chemist. B.A. (Hons. Chem.), Oxon. A.I.C. (*Signed by*) Matthew Whittam, F. D. Chattaway, G. R. Clemo.

GESELL, WILLIAM HANS, 235, Christopher Street, United States of America. General Manager of Laboratories and Works of Lehn and Fink, Inc., Bloomfield, N.J. Chemical Engineer, University of Michigan. Author of articles on Chemistry of Cellulose and on Production Pharmacy. I desire admission to the Chemical Society in order to keep abreast with progress in chemical science. (*Signed by*) H. V. Arny, Thomas J. Keenan, Virgil Coblentz.

GIDLEY, GUSTAVUS CHARLES, Brynmelyn College, Weston-super-Mare. British. Senior and Science Master at above College. A student of Chemistry for past 10 years. Entered and opened up Science at Brynmelyn nearly 5 years ago, since when I have successfully prepared candidates for University local exams. and London Matric.; 50—60 successes. I always endeavour to do all I can in the interests of Chemistry. Working for F.I.C. examination. (*Signed by*) John Taylor, E. T. H. Bucknell, A. E. Mills.

GOGTE, DWARKANATH V., Khamgaon, Central Provinces, India. Indian. C. P. Government Scholar at the Indian Institute of Science, Bangalore (India). B.Sc. of the Allahabad University in Chemistry. At present I am working on the hydrogenation of various Indian oils. (*Signed by*) M. O. Forster, H. E. Watson, Gilbert J. Fowler.

GOODING, STANLEY EVANS FRANCIS, 5, St. Andrew's Hill, Cambridge. British. Research Student. B.A. Natural Science Tripos, Pts. I and II, Cambridge. (*Signed by*) W. J. Pope, W. H. Mills, Hamilton McCombie.

GREEN, ALBERT, The Edward Davies Chemical Laboratories, Aberystwyth. British. Assistant-lecturer in Chemistry. B.Sc. (Wales), with 1st Class Honours in Chemistry. Assistant-lecturer in Chemistry at the University College of Wales, Aberystwyth, since 1921. (*Signed by*) T. Campbell James, C. R. Bury, H. Medwyn Roberts.

HAPPOLD, FRANK CHARLES, Ostley House, Barrow. British. B.Sc. (Honours, Manchester, 1923). Being desirous of obtaining the literature of the Society. (*Signed by*) Arthur Lapworth, Robert Robinson, D. H. Bangham.

HARDY, FRANCIS WOOD, Leefield House, Allerton, Bradford, Yorks. British. Senior and Organising Chemistry Master, Boys' Modern School, Leeds. B.Sc., London, 1913. Position held as above, and I desire admission because I am anxious to secure more intimate contact with recent research as a help in teaching Advanced Course work. (*Signed by*) T. Martin Lowry, Arthur Smithells, W. Lowson, H. M. Dawson, J. B. Cohen.

HEALEY, ALFRED THOMAS, 79, Popes Avenue, Twickenham. British. Student of chemistry at East London College, Mile End Rd., London, E. 1. I have passed the Inter-B.Sc. exam. and am sitting for B.Sc. Hons. Chem. in 1924. I wish to join the Society in order to keep in touch with the progress of chemical research. (*Signed by*) Eustace E. Turner, W. H. Patterson, J. R. Partington.

HENDERSON, STANLEY THOMAS, 50, Cambridge Avenue, London, N.W. 6. British. Research student. 1st Class Hons. in Chemistry in Cambridge Natural Sciences Tripos, 1922. B.A., 1922. 1st Class Hons. in Chemistry in London External B.Sc., 1922. Research studentship at Emmanuel College, Cambridge, 1922—1924. (*Signed by*) W. J. Pope, W. H. Mills, Hamilton McCombie, A. J. Berry.

HOPKINS, THOMAS, Glanwern, King George Avenue, Llanelly. British. Science Master at Barrow Junior Technical School. M.Sc. (Wales), B.Sc. (Lond.), F.I.C. Published paper *J.C.S.* 1920, May. 4 Years Manufacturing and Research Chemist at Messrs. Nobel's, Scotland. Science Master at Barrow Technical School. (*Signed by*) C. R. Bury, L. J. Hudleston, T. Campbell James.

HOSKING, JOHN READER, Sefton St., Wadestown, Wellington, New Zealand. British. Student of Chemistry. 5 Years on Chemical Staff of Colonial Sugar Refining Co., Ltd., Sydney, Australia. At present time student of Chemistry at University College, Auckland, N.Z. (*Signed by*) Thomas H. Easterfield, W. Frank Short, A. H. Bowell.

JACOBS, JULIAN MICHAEL SAMUEL, 125, Goldhurst Terrace, London, N.W. 6. British. Research Student. B.Sc., 1st Class Honours in Chemistry, London University, 1922. Since graduation engaged in research in organic chemistry. (*Signed by*) George Senter, F. Barrow, S. Sugden, Wm. W. Myddleton.

JACOBSON, BENNETT ALEXANDER, 92, Jules St., Johannesburg, S. Africa. British. Chemist and Druggist, and Analytical Chemist. Member of the Pharmaceutical Soc. Gt. Brit. Late Assistant Analyst, Metallurgy Dept., Witwatersrand Mines, Transvaal. Demonstrator in Chemistry and Physics, Johannesburg University. Certificates of Merit, Chemistry and Physics, London College. (*Signed by*) P. H. Woodnoth, A. Thomas, C. Diamond.

JENNINGS, JAMES SOWDEN, Worcester Villas, Godolphin Road, Helston, Cornwall. British Subject. Teacher of Chemistry and Mathematics at

the County Secondary School, Helston. Trained Certificated Teacher. B.Sc. Chemistry. (*Signed by*) Arthur Smithells, W. Lowson, J. B. Cohen, H. M. Dawson.

JONES, ALBERT OWEN, 1, Dark Gate, Carmarthen, S. Wales. Chemistry Master. B.Sc. (University of Wales). Student from 1911—1914, and after demobilization, Feb. 1919—June 1920. Pursued Honours B.Sc. Course; prevented from taking examination owing to operation. At present Teacher of Chemistry at Birkenhead Institute. (*Signed by*) John H. Foulger, Herbert John Evans, James Smith.

KANE, WILLIAM ROSS, 77, Glebe Road, Sheffield. British. Chemistry Master, Penistone Grammar School. B.Sc. (Lond.) in Chemistry, Physics, Pure Maths. 15 Years' experience in teaching Science. (*Signed by*) W. P. Wynne, F. G. Tryhorn, J. Kenner, G. H. Christie.

LAWSON, DIGBY RICHARD, Woodlea, Hartford, Cheshire. British. Research Chemist. M.A. (Oxon.). Research Chemist, c/o Messrs. Brunner, Mond, & Co., Northwich. (*Signed by*) F. A. Freeth, W. H. Perkin, N. V. Sidgwick, T. W. J. Taylor, F. G. Donnan, S. G. P. Plant, E. Hope.

LEWIS, WILLIAM CLIFFORD, Inversnaid, Shoreham-by-Sea. British. Senior Master at the Grammar School, Shoreham, Sussex. B.Sc. (Hons.). At present engaged in research in Organic Chemistry. (*Signed by*) T. Campbell James, C. R. Bury, L. J. Hudleston.

LIONS, FRANCIS, 17, Lincoln Grove, Chorlton-on-Medlock, Manchester. British Subject (born in Australia). Research Student in Organic Chemistry at the Victoria University of Manchester. B.Sc. (Sydney), 1st Class Honours Chemistry and 1st Class Honours Organic Chemistry. 1851 Scholar for Australia, 1923. Engaged at present in Research in Organic Chemistry at the Victoria University of Manchester. (*Signed by*) Arthur Lapworth, R. Robinson, J. C. Smith, F. M. Irvine.

MAW, WILLIAM, B.Sc., 82, Holly Avenue, Newcastle-upon-Tyne. English. Research Student. B.Sc. of Armstrong College, University of Durham. 1st Class Honours in Chemistry. (*Signed by*) W. N. Haworth, G. C. Leitch, H. V. A. Briscoe.

MAY, CECIL JOHN, 19, Tyndale Place, Islington, London, N. 1. English. Student of Chemistry. (*Signed by*) H. F. Harwood, James C. Philip, H. B. Baker.

MILLS, HENRY COMPTON, 25, Cape Road, Warwick. British. Science Master. B.A. (Oxon.), 2nd Class Honours in Chemistry. B.Sc. (London). (*Signed by*) Allan F. Walden, Frederick Soddy, M. P. Applebey, N. V. Sidgwick.

NAIDU, PASUPU KRISHNASWAMI RAJAMANIKKAM, 52, Pedariar Koil Street, Madras, India. Hindu-Indian. Ag. Principal, Government Leather Trades Institute, Washermanpet, Madras, India. Underwent full course of training in Leather Chemistry and Leather Manufacture in Leather Sellers' College, London. Permanent Vice-Principal of the Govt. Leather Trades Institute, and now the Acting Principal. Member of the Society of the Leather Trades Chemists. (*Signed by*) A. K. Menon, P. S. Chowdary, M. Suhramania Sastry.

POWELL, DONALD, 73, Sedgeford Rd., Shepherd's Bush, W. 12. British. Assistant Chemist to the Research Association of the British Motor and Allied Manufacturers. Previously Assistant Chemist to Mr. Percy Edgerton, A.I.M.M., F.C.S., Nov. 1921 to Aug. 1923. (*Signed by*) Percy Edgerton, J. B. Coleman, Francis Arnall, F. H. Lowe.

RAY, SUDHINDRANARAYAN, 19/4, Madan Mitra Lane, Calcutta, India. Bengalee. Superintendent of Excise and Salt, Calcutta Distillery Branch.

1st Class M.Sc. (Calcutta University). In his official capacity, he is in charge of one of the biggest distilleries in India and four important bonded laboratories, where tinctures and other spirituous medicinal preparations are manufactured; deals with all matters connected with industrial use of alcohol. (*Signed by*) R. L. Jenks, B. M. Chakravarti, J. C. Ghosh.

RICHARDSON, HENRY OATES, Ashworth House, Ashworth Rd., Dewsbury, Yorks. British. Works and Analytical Chemist to Mark Day & Son, Dewsbury, Manufacturers of Dyewood, Tanning Extracts, Chemicals (6 years in this position as head). 6 Years Chemistry Student, Dewsbury Technical College. Final Certificate in Chemistry, Dewsbury Technical College. Member, Society of Leather Trades Chemists; member, Society of Dyers and Colourists; member, British Association of Chemists; National Certificate in Chemistry. (*Signed by*) H. J. Taylor, S. J. Hopkins, H. W. Gorbold.

ROSS, NEIL GILLIES, Caroni Estate, Caroni, Trinidad, B.W.I. Scottish. Analytical Chemist. Chief chemist to The Trinidad Estates Co., Ltd., for past 3½ years and to date. Formerly assistant chemist with John Walker & Co., Greenock, 6 years. War service, 1914—1919. Attended Royal Technical College, Glasgow. I wish to join in order to receive the advantage of the literature issued by the Society. (*Signed by*) Angus Smith, Thomas Gray, F. J. Wilson.

RUSHWORTH, JAMES, 11, Smithy Carr Lane, Brighouse. Works Chemist, Messrs. T. F. Firth & Sons, Ltd., Carpet Manufacturers, of Brighouse and Heckmondwike. Student, Rastrick Grammar School, till 1919; student, Huddersfield Technical College, 1919—1922, at the latter place having been doing Research for 12 months. At present (for 12 months) Works Chemist in carpet manufacture. (*Signed by*) L. Gordon Paul, E. Norman Langham, James Bruce.

RYDER, CHARLES DUDLEY, Assoc. I.R.S.M. (Leoben), Clan William Street, Chatswood (Sydney). Naturalised Austrian (Australian). Manufacturing and Research Chemist and Consulting Engineer. *Education:* Viennese Grammar School; Associate of Imp. Royal School of Mines, Leoben, Styria (Austria); special courses in Organic Chemistry at Technical Colleges of Vienna, Universities of Marburg and Leipzig. *Practice:* From 1898—1903 with a number of firms in Austria and Hungary. Since 1904 practised on his own in South Africa (for three years) in Natal, Transvaal and Rhodesia. Since 1907 in Australia, engaged with various large concerns; invariably managing Technological Departments and in charge of chemical laboratories. Of later engagements may be mentioned: From 1917—1922 Chief Chemist and Consulting Engineer to F. A. Henriques, Ltd., Manufacturing Chemists, Importers and Exporters, Sydney, Brisbane, Melbourne, and Perth. At present Chief Chemist of Lockwood & Magrath, Ltd., 163, Kent Street, Sydney, Essential Oil Distillers, Synthetic Chemicals, etc., Manufacturing Chemists. *Travels:* Has visited (besides South Africa) Austria, Hungary, Italy, Spain, Germany, England, Scotland, U.S.A., India, and New Zealand; speaks and writes four languages. (*Signed by*) George Z. Du Pain, Francis L. Watt, F. H. Molesworth, Henry G. Smith.

SHARP, ERNEST GOULDING, 52, Castle St., Dover. British. Manufacturing Chemist. I have been engaged for some considerable time in extensive experimental work, with regard to the utilisation of Propyl Alcohol, in the manufacture of synthetic perfumes, and my reason for desiring to become a Fellow of the Chemical Society is that I desire the privilege of attending the Scientific Meetings. (*Signed by*) H. Lawrence, Jos. Cowper, Herbert B. Hammond.

SHINODA, JUNZO, Chemical Dept., Victoria University, Manchester. Japanese. Research Student. Research Chemist, sent abroad by Japanese Government. (*Signed by*) Robert Robinson, Garfield Thomas, Leslie Randal Ridgway, Thomas Malkin.

SIMS, WILLIAM HENRY, 2, Churchville, Radford, Nottingham. British. Assistant Chemist, Boots Pure Drug Co., Ltd., Nottingham. 6 Years' attendance at evening classes held at the Nottingham University College, in Mathematics, Chemistry, and Physics. For 7 years employed in the Fine Chemical Dept. of Boots Pure Drug Co., on the manufacture of Alkaloids, and for 3 years on the research and manufacture of Organic Arsenicals. (*Signed by*) Harold Calam, Harold B. Holthouse, Bertram A. Bull, H. Droop Richmond, W. J. Bowis.

SINGH, KISHEN, Hyderabad, Deccan, India. British Subject, Indian. Hyderabad (State) Scholar. H.E.H. The Nizam's Service. Research Department (Applied Chemistry), College of Technology, Manchester. B.Sc. in pure and applied chemistry, Punjab University. Science Master in Govt. High School in South India and North India (D.A.V.). Analytical chemist, with a Manufacturing Chemist. Submitted thesis on Sugar Manufacture in India; doing research at present. (*Signed by*) John K. Wood, F. M. Rowe, D. D. Kanga, Jul. Hübner.

SMITH, JAMES MUIR, B.Sc., 8, Hepscott Ter., S. Shields. British. Research Student. 1st Class Honours in Chemistry at Armstrong College, Newcastle-on-Tyne, University of Durham. (*Signed by*) W. N. Haworth, D. Arthur Ruell, Birkett Wylam.

STEVENS, HAROLD ROBERTS, 9, Panton St., Cambridge (Pembroke College). British. Research Student. 1st Class, Pt. II, Natural Sciences Tripos (Cambridge). Chemistry Scholar and Research Student of Pembroke College, Cambridge, B.A., 1921. (*Signed by*) W. J. Pope, W. H. Mills, Hamilton McCombie.

SUTHERLAND, JOHN GEORGE, Boksburg, Transvaal, S. Africa. British (Scots). Lecturer in Science, Boksburg Normal College. Hons. Degree in Maths. and Applied Maths. of Edinburgh. Studied chemistry at Edinburgh University under Prof. Crum Brown and at the Heriot-Watt Technical College for 4 years. Lecturer and Teacher of Chemistry for 12 years in Edinburgh, Rhodesia, and Transvaal. (*Signed by*) James Moir, J. McCrae, J. A. Wilkinson.

TAYLOR, COLIN KENNETH, 21, Cromwell Road, South Kensington, S.W. 7. Anglo-Indian, British. Student. B.A. (Chemistry), Madras University, India. Is now studying Applied Chemistry at Battersea Polytechnic. (*Signed by*) Robert H. Pickard, J. Kenyon, Harold Hunter.

TERADA, SHŌICHI, No. 20, Wakamiya Chō, Ushigome, Tokyo, Japan. Japanese. Bachelor of Pharmacology. Author of a paper on "The condensation of pyruvic acid with formaldehyde," in collaboration with Y. Asahina. Lecturer on Pharmacology in the Imperial University of Tokyo. (*Signed by*) Joji Sakurai, Rikō Majima, Hiroshi Nomura.

TERVET, WILLIAM PEARSON, "Waverley," Compton Park Road, Plymouth. Scottish. Engineer and Manager, Gas Works, Devonport. Student at People's Palace, Mile End Road, Inorganic and Organic Chemistry. Junior assistant for 6 years, Tottenham Gas Works, laboratory testing. Assistant engineer, Plymouth Gas Works, for 6 years, cyanide recovery. Engineer at Devonport, 14 years. (*Signed by*) James R. Thackrah, Philip G. G. Moon, J. T. Hewitt.

THIN, RUSSELL GIBSON, 2, Chalmers Crescent, Edinburgh. British.

Analytical and Consulting Chemist. B.Sc. (Edinburgh); Associate, Institute of Chemistry. Contribution to Transactions of the Chemical Society with Dr. A. C. Cumming in 1915 on "Estimation of Potassium by the Perchlorate Method." (*Signed by*) Alexander Scott, James Walker, Sydney A. Kay.

THORNE, WILLIAM TRICK, 40, Canton Rd., Shanghai. British. Pharmaceutical Chemist. Manager, Chemical Dept., Messrs. Allen & Hanbury's, Ltd., Shanghai. Major Diploma, Pharmaceutical Society. Interested in Analytical Chemistry and desirous of keeping in touch with current chemical literature. (*Signed by*) C. E. Corfield, F. W. Gamble, Frank Browne, Norman Evers.

THORNTON, ARTHUR JAMES EDWARD, 38, Battersea Park Rd., S.W. 11. British. Analytical Chemist (Air Ministry). King's College (Student), 1919—1921. Inter-B.Sc. (Chemistry and Physics). I desire to attend the meetings, etc., to keep in touch with current research. 1921 to date, Chemist employed by Air Ministry (Aeronautical Inspection Directorate). (*Signed by*) J. W. Farmery, J. Outram Cutter, P. C. Austin.

TOMKINSON, MARGARET GROSVENOR, Chilton, Cleobury Mortimer, Salop. Chemist. Camb. Univ., Nat. Sci. Tripos, Pt. I, 1914. Analytical Chemist at Messrs. Stewarts & Lloyds, Ltd., Halesowen, Birmingham, 1916—1919. Assistant Lecturer in Nat. Science, Girton College, Cambridge, 1919—1921. Associate of the Institute of Chemistry, 1920. Girton College Travelling Fellowship, 1921—1922. Research work with Prof. Paul Sabatier, University of Toulouse. Docteur ès Sciences, University of Toulouse, Dec. 1922. Note in *Comptes Rendus de l'Academies des Sciences*, Paris, Jan. 3rd, 1923. (*Signed by*) C. T. Heycock, W. H. Mills, W. G. Palmer.

TURNER, PERCIVAL ELISHA, Bath Road, Beenham, near Reading. British. Demonstrator in Chemistry, Imperial College of Tropical Agriculture, Trinidad. B.Sc., Hons. Chemistry, London (External). Associate, Institute of Chemistry. Associate, University College, Reading. Student Demonstrator in Chemistry, University College, Reading, 1922—1923. (*Signed by*) H. Bassett, J. W. Dodgson, R. G. Durrant, D. Roy Maxted.

WAKEFORD, LESLIE ERNEST, "Bisham," 14, Woolstone Rd., Catford, S.E. 6. British. Pupil assistant of Mr. Percy Edgerton, analytical chemist. Student of the Institute of Chemistry. Student at Sir John Cass Technical Institute. (*Signed by*) P. C. L. Thorne, Percy Edgerton, Henry J. S. Sand, Stephen B. Bowyer.

WALKER, OSWALD JAMES, 24, Buccleuch Place, Edinburgh. British. Lecture Assistant, Edinburgh University, Chemistry Department. Degree of B.Sc. with 1st Class Honours in Chemistry, Edinburgh University. (*Signed by*) James Walker, Sydney A. Kay, Leonard Dobbin.

WEBER, ISAAC EPHRAIM, B.Sc. (Lond.), 12, Claremont Road, Luton. British. Chief Chemist, Messrs B. Laporte, Ltd., Luton. Student at University College, London, 1914—1917. Chief Chemist, Messrs. B. Laporte, Ltd., 1919—1923. (*Signed by*) F. G. Donnan, S. Judd Lewis, S. Smiles.

WITCOMBE, FRANK WILLIAM, 85, Holland Rd., Maidstone. British. Analytical Chemist. 1913—1914, Pupil and assistant to Mr. Percy Edgerton, F.C.S. 1915—1917, Assistant chemist, Works Laboratory, Chatham Dockyard. (Service in Royal Air Force.) 1921—1923, Chemist in charge, Works Laboratory, Chatham Dockyard. (*Signed by*) Percy Edgerton, D. B. Butler, J. A. Smythe, P. L. Robinson.

WOODHEAD, DONALD WHITLEY, 248, Claremont Road, Moss Side, Manchester. British. Research Chemist. B.Sc. (Manchester). Twelve months' research at Manchester University on photographic analysis of gaseous

explosions. Research Assistant to the Manchester Corporation Air Pollution Advisory Board at Manchester College of Technology. (*Signed by*) H. B. Dixon, A. Lapworth, Colin Campbell, H. Wood.

The following Certificates have been authorised by the Council for presentation to ballot under Bye-law I (2):

KERRY, ARTHUR NICHOLAS, Jose Cubas 4725, Buenos Aires. English. Asst. Analytical Chemist, Buenos Aires and Pacific Railway, Buenos Aires, Argentine Republic. 7 Years as Chief Assistant to Mr. A. Courtenay Luck, F.I.C., F.C.S., Calle 25 de Mayo 611, Buenos Aires. (*Signed by*) A. Courtenay Luck.

LISSENBOROUGH, ROBERT, Cawnpore. English. Manager, Cawnpore Sugar Works, Limited, Cawnpore. Analytical and Manufacturing Chemistry, Sugar Refining and Distilling. Manager, Refinery and Distillery, Cawnpore Sugar Works, Ltd. (*Signed by*) E. L. Watson, G. Peace.

WALSH, LIONEL O. P., 242, Westmount Boulevard, Montreal. English. Vice-President and General Manager, Dominion Tar and Chemical Co., Limited, Montreal. (*Signed by*) Arthur O. Ponder.

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OPPENHEIMER, CARL. Kurzes Lehrbuch der Chemie in Natur und Wirtschaft. Nebst einer Einführung in die allgemeine Chemie

von JOHANN MATULA. Leipzig 1923. pp. xx + 258 + 862. ill. 25*s*. net. (*Recd.* 26/10/23.)

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SCIENTIFIC AND INDUSTRIAL RESEARCH, Department of. Report of the Oxygen Research Committee. London 1923. pp. viii + 178. ill. (*Reference.*) 8*s*. 6*d*. net. From the Department.

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LANDOLT, HANS HEINRICH, and BÖRNSTEIN, RICHARD. Physikalisch-chemische Tabellen. 5th edition. Edited by WALTHER ADOLF ROTH and KARL SCHEEL. 2 vols. Berlin 1923. pp. xvi + 1696. ill. (*Reference.*)

LÖHNIS, FELIX, and FRED, EDWIN BROUN. Textbook of agricultural bacteriology. New York 1923. pp. x + 284. ill. 15*s*. net. (*Recd.* 17/10/23.)

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MCMILLAN, WALTER GEORGE. A treatise on electro-metallurgy: embracing the application of electrolysis to the plating, depositing, smelting, and refining of various metals [&c.]. 4th edition. Revised by WILLIAM RANSON COOPER. London 1923. pp. xvi + 454. ill. 21*s*. net. (*Recd.* 17/10/23.)

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PETERSON, FREDERICK, HAINES, WALTER S., and WEBSTER, RALPH W. [Editors.] Legal medicine and toxicology. 2nd edition. 2 vols. Philadelphia 1923. pp. 1196, 13—1072. ill. (*Reference.*) £5 net.

POLLITT, ALAN A. The causes and prevention of corrosion. London 1923. pp. 230. ill. 25*s*. net. (*Recd.* 17/10/23.)

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STARLING, ERNEST HENRY. The action of alcohol on man.

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WRIGHT, ARTHUR. Industrial filtration. New York 1923. pp. 336. ill. 25*s.* net. (*Recd.* 31/10/23.)

ZSCHIMMER, EBERHARD. Theorie der Glasschmelzkunst als physikalisch-chemische Technik. I. Jena 1923. pp. viii + 128. ill. (*Recd.* 25/10/23.)

III. *Pamphlets.*

HESLINGA, JACOB. Onderzoekingen over de quantitatieve bepaling van chloor, broom en jodium in organische verbindungen. Amsterdam [1923]. pp. viii + 72. ill.

MADRAS, GOVERNMENT OF. Annual Report of the Chemical Examiner for 1922. By CLIVE NEWCOMB. Madras 1923. pp. 12.

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RICHARDSON, WILLIAM D. Science in the packing industry. Chicago 1923. [pp. 70.]

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SIMONSEN, JOHN LIONEL. The constituents of some Indian essential oils. Parts VIII—X. (From the *Indian Forest Records*, 1923, 9.)

SINNATT, FRANK STURDY, and SLATER, LEONARD. The determination of carbon monoxide in vitiated air, including the analysis of mine gases. (*Lancs. and Cheshire Coal Research Assoc.* Bulletin No. 13.) London 1923. pp. 22. ill.

STOCK, PHILIP GRAHAM, and MONIER-WILLIAMS, GORDON WICKHAM. Preliminary report on the use of hydrogen cyanide for fumigation purposes. (Ministry of Health Reports on Public Health and Medical Subjects. No. 19.) London 1923. pp. viii + 84. ill.

SUDAN GOVERNMENT. *Wellcome Tropical Research Laboratories, Khartoum.* Report of the Government Chemist for the year 1922. Chemical Section—Publication No. 26. Khartoum [1923]. pp. 30.

THERIAULT, EMERY J., and CLARK, WILLIAM MANSFIELD. An experimental study of the relation of hydrogen ion concentrations to the formation of floc in alum solutions. (From the *U.S. Public Health Reports*, 1923, **38**.)

UNITED STATES. *Department of Agriculture.* Bulletin No. 1129. A physical and chemical study of milo and feterita kernels. By GEORGE L. BIDWELL, LESLIE E. BOPST, and JOHN D. BOWLING. Washington 1923. pp. 8.

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WASASTJERNA, JARL A. L'hydrolyse en solutions aqueuses de sulfhydrate de potassium. (From the *Soc. Sci. Fennica Com. Phys.-Mat.*, 1923, **1**.)

—— On the radii of ions. (From the *Soc. Sci. Fennica Com. Phys.-Mat.*, 1923, **1**.)

—— On the refraction equivalents of ions and the structure of compound ions. (From the *Soc. Sci. Fennica Com. Phys.-Mat.*, 1923, **1**.)

—— Sur l'hydrolyse du monosulfure de potassium. (From the *Soc. Sci. Fennica Com. Phys.-Mat.*, 1923, **1**.)

WILLIAMS, DAVID EMRYS, and JAMES, THOMAS CAMPBELL. The addition of hydrogen to acetylenic acids. (From *Aberystwyth Studies*, 1922, **4**.)

WOOLWICH, *Research Department.* R. D. Report No. 22. (Part III.) The viscosity of cellulose. London 1923. pp. 8. ill.

CHEMICAL SOCIETY

PROCEEDINGS

OF THE

CHEMICAL SOCIETY.

Ordinary Scientific Meeting, Thursday, December 6th, 1923, at 8 p.m., Professor W. P. WYNNE, D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death, of:

	Elected.	Died.
Sidney Knowles Muspratt	Dec. 3rd, 1873	Nov. 30th, 1923

Certificates were read for the first time in favour of:

Reginald Graham Atkinson, A.R.C.S., 35, Heathdene Road, Streatham, S.W. 16.
Thomas Ethelred Wilby Browne, B.Sc., 26, York Street, Norwich.
Francis Herbert Culverhouse Butler, B.A., A.I.C., South End, St. Cross, Winchester.
Frederick William Jeffery Clendinnen, M.Sc., Carlton Brewery, Melbourne.
Alan Rowland Cluer, B.Sc., A.R.C.S., 36, Dunmore Road, Wimbledon, S.W. 20.
Talati Dadabhai Cursedji, D.T.M., D.P.H., Baroda.
Winifred Esther Dickes, B.Sc., Eversley, Carlyle Road, Croydon.
Sikhibhushan Dutt, 21, Cromwell Road, South Kensington, S.W. 7.
Ernest William Ewell, 37, Townwall Street, Dover.
Maurice Duncan Farrow, B.Sc., A.R.C.S., 89, Windsor Road, Ilford.
Roy William Harman, M.Sc., Netherend, Woodcroft Avenue, Mill Hill, N.W. 7.
Eric Leighton Holmes, A.R.C.S., 58, St. George's Square, S.W. 1.
Harry Graham Leigh, B.Sc., 46, Brent View Road, West Hendon, N.W. 9.
Eva Rebecca Levy, 21, St. James' Mansions, West Hampstead, N.W. 6.
George Hazlewood Locket, B.A., Salmon's Cross, Reigate.
George M'Owan, B.Sc., Ph.D., Chattan House, St. Andrews.
Walter Matthew Madgin, M.Sc., A.I.C., Armstrong College, Newcastle-on-Tyne.
Andrew More, A.R.C.S., F.I.C., Ellesmere, King's Road, Walton-on-Thames.
John Rae, The Hollies, Thingwall Road, Wavertree.
Harry Nathan Sher, B.Sc., A.R.C.S., 8, Cleve Road, Hampstead, N.W. 3.
Charles William Shoppee, B.Sc., A.R.C.S., 38, Womersley Road, Crouch End, N. 8.
Frank Harold Smith, M.A., Hazelbank, Beech Road, Reigate.
Laurence Frederick Smith, B.Sc., A.R.C.S., 62, Robertson Road, Brighton.

Margaret Llewellyn Smith, 5, The Grove, Highgate, N. 6.
Richard Leslie Swan, B.Sc., A.I.C., 221, Bedford Road, Rockferry.
Sidney Thornley, M.Sc., 10, Kersal Avenue, Pendlebury, Manchester.
Walter John Worboys, B.Sc., Lincoln College, Oxford.

Dr. H. M. Atkinson and Dr. J. Kenyon were elected Scrutators, and a ballot for the election of Fellows was held. The following were subsequently declared elected as Fellows:

Gopaldas Dharmdas Advani, B.A., B.Sc.
Edward Bertram Anderson.
James Sinclair Standish Anderson.
Yasuhiko Asahina, Dr.Pharm.
Ernest Edgar Aynsley, B.Sc.
Francis Harrold Banfield, B.Sc.
Charles Rowan Barker.
Geoffrey Gordon Barker, B.Sc.
Charles Bateman.
Louis Leighton Bircumshaw, B.A., M.Sc.
Stanley Boulter, B.A.
John Thomas Burdekin, B.Sc.
John Herbert Bushill, M.Sc.
Atmaram Chakravarti, B.Sc.
Har Sahai Chaturvedi, B.Sc.
Alfred Chick.
Samuel Coffey, M.Sc., Ph.D., A.I.C.
Prince Piero Ginori Conti.
Edward Sackett Dewing.
Moritz Adolf Dittmar, B.Sc., Ph.D.
James Joseph Doolan, B.Sc., A.I.C.
The Rt. Hon. Viscount Exmouth.
George Fearnley.
George Thomas Randles Francis.
Albert Thomas Fuller, B.Sc.
Phani Bhusan Ganguly, M.Sc.
Frank Leslie Garton, B.A., A.I.C.
William Hans Gesell.
Gustavus Charles Gidley.
Dwarkanath V. Gogte, B.Sc.
Stanley Evans Francis Gooding, B.A.
Albert Green, B.Sc.
Frank Charles Happold, B.Sc.
Francis Wood Hardy, B.Sc.
Alfred Thomas Healey.
Stanley Thomas Henderson, B.A., B.Sc.
Thomas Hopkins, M.Sc., F.I.C.
John Reader Hosking.
Julian Michael Samuel Jacobs, B.Sc.
Bennett Alexander Jacobson.
James Sowden Jennings, B.Sc.
Albert Owen Jones, B.Sc.
William Ross Kane, B.Sc.
Arthur Nicholas Kerry.
Digby Richard Lawson, M.A.
William Clifford Lewis, B.Sc.
Francis Lions, B.Sc.
Robert Lissenborough.
William Maw, B.Sc.
Cecil John May.
Henry Compton Mills, B.A., B.Sc.
Pasupu K. Rajamanikkam Naidu.
Donald Powell.
Sudhindranarayan Ray, M.Sc.
Henry Oates Richardson.
Neil Gillies Ross.
James Rushworth.
Charles Dudley Ryder.
Ernest Goulding Sharp.
Junzo Shinoda.
William Henry Sims.
Kishen Singh, B.Sc.
James Muir Smith, B.Sc.
Harold Roberts Stevens, B.A.
John George Sutherland, B.Sc.
Colin Kenneth Taylor, B.A.
Shoichi, Terada, B.Pharm.
William Pearson Tervet.
Russell Gibson Thin, B.Sc., A.I.C.
William Trick Thorne.
Arthur James Edward Thornton.
Margaret Grosvenor Tomkinson, D.-ès-Sc.
Percival Elisha Turner, B.Sc., A.I.C.
Leslie Ernest Wakeford.
Oswald James Walker, B.Sc.
Lionel O. P. Walsh.
Isaac Ephraim Weber, B.Sc.
Frank William Witcombe.
Donald Whitley Woodhead, B.Sc.

The following papers were read :

"The additive formation of four-membered rings. Part III. A system of nomenclature for heterocyclic four-membered rings and the formation and properties of some derivatives of β-methylenedi-imineoxide." By C. K. INGOLD.

"The dependence of polarisation-overvoltage on hydroxyl and hydrogen-ion concentration. Part I. Polarisation-overvoltage of an antimony cathode in aqueous alkaline solution.' By H. J. S. SAND and E. J. WEEKS.

"Stereoisomerism and local anæsthetic action in the β-eucaine group. Resolution of β- and *iso*-β-eucaine." By H. KING.

"β-Alizarin. An isomeric form of alizarin." By A. GREEN.

"The isomerism of the oximes. Part XV. The supposed fourth benzildioxime." By O. L. BRADY and F. P. DUNN.

"The alternation in the heats of crystallisation of the normal monobasic fatty acids." By W. E. GARNER and F. C. RANDALL.

Ordinary Scientific Meeting, Thursday, December 20th, 1923, at 8 p.m., Professor W. P. WYNNE, D.Sc., F.R.S., President, in the Chair.

The PRESIDENT referred to the loss sustained by the Society, through death, of the following Fellows :

	Elected.	Died.
Frank Clowes	Mar. 18th, 1869	Dec. 18th, 1923
Arnaud de Gramont	Dec. 1st, 1910	Oct. 31st, 1923

The President announced that at the Council meeting held that afternoon the following resolutions had been unanimously passed :

1. The Council desires to congratulate Professor G. D. Liveing on the completion on the 21st November, 1923, of his 70 years of Fellowship, and to convey to him an expression of its warm wishes for his happiness in the coming year. It requests Professor Lowry, Dr. McCombie and Dr. Mills, Members of the Council, to wait on Professor Liveing to-morrow on the occasion of his 96th birthday to convey the Society's congratulations and good wishes.

2. The Council accepts with profound regret the resignation of Mr. John Greenaway as Editor, and desires to place on record its high appreciation of the eminent services he has rendered to the Society and to the science of chemistry in general during the period with which he has been connected with the Society's publications. The Council sincerely trusts that his health may be completely restored and that he may be spared many years to enjoy the

happiness and leisure to which his unselfish work in the interests of our science so richly entitles him.

It was also announced that the Harrison Memorial Prize Selection Committee, consisting of the Presidents of The Chemical Society, The Institute of Chemistry, The Society of Chemical Industry, and the Pharmaceutical Society, had unanimously resolved that no award of the Harrison Memorial Prize be made for 1923.

Certificates were read for the first time in favour of:

Harold John Channon, B.A., B.Sc., 28, Glenhouse Road, Eltham, S.E. 9.
George Duncan Crosley, 134, Cranbrook Road, Ilford.
Henry George Denham, M.A., D.Sc., Ph.D., Canterbury College, Christchurch, New Zealand.
Charles Richmond Featherstone, B.A., Clifton Rise, York.
Oscar Adolf Mendelsohn, B.Sc., 85, Collins Street, Melbourne.
David Doig Pratt, 57, Barlow Moor Road, Didsbury, Manchester.
Alfred Scholes, F.I.C., Alma House, Junction Road, Norton, Stockton-on-Tees.
Masuzo Shikata, c/o Mrs. Bloman, 261, Bašta sv. Jiří, Prague IV.
William Arthur Silvester, M.Sc., 10, Moxley Road, Crumpsall, Manchester.
Frederick Arnold Stead, 11, Queen's Terrace, Middlesbrough.
George Taylor, A.I.C., Brook Cottage, Matlock Green, Derbyshire.
Bryan Topley, B.A., 104, Park Lane, Croydon.
Emily Gertrude Turner, M.Sc., 2, Steel Bank Villas, Commonside, Sheffield.
John Weir, M.A., B.Sc., Ph.D., F.I.C., Nobel's Explosives Co., Ltd., Ardeer Factory, Stevenston.
Frank Archer Williams, B.Sc., 27, Cotswold Road, Westcliff-on-Sea.

A Certificate has been authorised by the Council for presentation to ballot under Bye-Law I (2) in favour of:

Lionel Lazarus, 18, Crart Street, Durban, Natal.

The following papers were read:

"The relation between the glow of phosphorus and the formation of ozone." By W. E. Downey.

"The origin of mutarotation and the mechanism of isomeric change. A reply to Baker, Ingold, and Thorpe." By T. M. Lowry.

"The action of inorganic haloids on organo-metallic compounds." By F. Challenger and F. Pritchard.

"Organo-derivatives of bismuth. Part VII. Iodo- and nitro-derivatives of triphenylbismuthine." By J. F. Wilkinson and F. Challenger.

"Migration of groups in derivatives of benzoin and desylamine." By A. McKenzie and R. Roger.

ORDINARY SCIENTIFIC MEETING.

The next Ordinary Scientific Meeting will be held on Thursday, January 17th, 1924, at 8 p.m.

List of Papers received between November 16th and December 20th, 1923. (This List does not include the titles of papers which have been read at a Scientific Meeting, or which have appeared in the Transactions.)

"Nitrochlorobenzenes and thiocarbamides." By J. TAYLOR and A. E. DIXON.

"Diazonium tetrachloroiodides." By F. D. CHATTAWAY and F. L. GARTON.

"Piperitone. Part VII. The constitution of piperitone." By J. READ, H. G. SMITH, and R. S. HUGHESDON.

"The preparation of 2-nitro- and of 4-nitro-1-naphthol." By H. H. HODGSON and E. KILNER.

"Alkaline reduction of the carbon tetrahalides." By R. O. GRIFFITH and L. HUNTER.

"The reduction of the mono-halogenated phenols." By J. B. SHOESMITH and R. H. SLATER.

"Polarity effects in the isomeric ω-bromotoluic acids." By J. B. SHOESMITH and A. C. HETHERINGTON.

"Quantitative reduction by hydriodic acid of halogenated malonyl derivatives. Part III. A study of the mechanism of the reaction." By R. W. WEST.

"The quantitative character of the interaction of glucose and phenylhydrazine." By E. KNECHT and F. P. THOMPSON.

"The system antimonious oxide–hydrochloric acid–water." By C. LEA and J. K. WOOD.

"The application of Hoesch's synthesis to the preparation of 2 : 4 : 2′ : 4′-tetrahydroxybenzophenone." By J. B. SHOESMITH and J. HALDANE.

"The promoter action of palladium on copper. Part I. Catalytic combustion." By W. W. HURST and E. K. RIDEAL.

"The constitution of Kojic acid, a γ-pyrone derivative formed by *Aspergillus oryzæ* from carbohydrates." By T. YABUTA.

"Synthesis of cyclic polysulphides. Part I. Condensation of dithioethylene glycol with benzal chloride." By P. C. RÂY.

"A synthesis of pyrylium salts of anthocyanidin type. Part III. A new synthesis of pelargonidin chloride." By D. D. PRATT and R. ROBINSON.

"A synthesis of pyrylium salts of anthocyanidin type. Part IV. Flavylium salts related to chrysin, apigenin, and luteolin." By D. D. PRATT, R. ROBINSON, and P. N. WILLIAMS.

"Some derivatives of benzopyrylium." By R. ROBINSON and (in part), H. G. CRABTREE, C. K. DAS, W. LAWSON, R. W. LUNT, B. H. ROBERTS, and P. N. WILLIAMS.

"Some benzopyrylium salts." L. R. RIDGWAY and R. ROBINSON.

"A note on the synthesis of the higher monoalkylmalonic acids." By G. M. ROBINSON.

"A note on the prevention of 'bumping' during vacuum distillation." By H. G. BECKER.

"The labile nature of the halogen atom in organic compounds. Part XI. The action of hydrazine on the halogen derivatives of malonamides, and of acetoacetic esters." By E. L. HIRST, A. K. MACBETH, and D. TRAILL.

"Harmine and harmaline. Part VIII. The constitution of certain harmaline derivatives." By H. NISHIKAWA, W. H. PERKIN, and R. ROBINSON.

"The correlation of additive reactions with tautomeric change. Part II. The aldol reaction. The effect of homology on reversibility in relation to the stability of carbon structures." By E. H. INGOLD.

"The action of sulphur on amines. Part III. para-Chloroaniline." By H. H. HODGSON and J. H. WILSON.

"Device for gas-heated thermostats." By W. MURRAY.

"The interaction of acetoacetic ester with ortho-hydroxystyryl ketones." By T. A. FORSTER and I. M. HEILBRON.

"Reduction products of the hydroxy-anthraquinone. Part IV." By J. W. E. HALLER and A. G. PERKIN.

"The unimolecular decomposition of phosphine." By C. N. HINSHELWOOD and B. TOPLEY.

"The chemistry of lignin. Part I. Flax lignin and some derivatives." By W. J. POWELL and H. WHITTAKER.

"The constitution of disulphoxides. Part I." By S. SMILES and D. T. GIBSON.

"Dyes derived from acenaphthenequinone." By A. C. SIRCAR and S. K. GUHA.

"The promoter action of palladium on copper. Part II. The adsorption of hydrogen and carbon monoxide." By W. W. HURST and E. K. RIDEAL.

"Studies on the dolomite system." By H. L. J. BÄCKSTRÖM.

"The additive formation of four-membered rings. Part IV. The influence of temperature on the tendency towards self-addition of the nitroso-group." By C. K. INGOLD and H. A. PIGGOTT.

"Studies on hypophosphorous acid. Part VI. Its reaction with chromic acid." By A. D. MITCHELL.

"The catalytic effects of the oxides of cerium and thorium, and

their bearing on the theory of the Welsbach mantle." By R. L. SWAN.

"Intermittent current electrolysis. Part III. The measurement of overvoltage." By S. GLASSTONE.

"The oxime of mesoxamide (*iso*nitrosomalonamide) and some allied compounds. Part V. Structural and stereoisomeric methyl ethers of the *p*-tolyl derivatives." By A. PLOWMAN and M. A. WHITELEY.

"A new method of synthesis of thiocarbohydrazide: mono- and dithio-paraurazine." By P. C. GUHA and S. C. DE.

"Germanium. Part I. The mineral germanite and the extraction of germanium and gallium therefrom." By J. S. THOMAS and W. PUGH.

"The relative reactivities of the substituted sodio-acetoacetic esters with ethyl iodide." By C. A. BARTLETT, J. J. CREASY, and R. E. MITCHELL.

"The isomerism of the oximes. Part XVI. The action of ultra-violet light on oximes and their derivatives." By O. L. BRADY and G. P. MCHUGH.

"The transference numbers, and the derived ionic complexity of hydrofluoric acid solutions." By C. W. DAVIES and L. J. HUDLESTON.

"Migration of groups in derivatives of benzoin and desylamine." By A. MCKENZIE and R. ROGER.

"Fractional crystallisation of common lead." By R. H. ATKINSON.

"A suggested explanation of the allotropic transformations of iron." By R. H. ATKINSON.

"The effect of small alternating currents on polarised electrodes." By S. GLASSTONE.

"Note on the influence of intermittent current on overvoltage." By S. GLASSTONE.

"The colour and constitution of the cobaltous compounds." By R. HILL and O. R. HOWELL.

"Contraction on solution." By J. N. RAKSHIT.

"Some binary systems composed of acetic acid and the homologues of aniline." By E. A. O'CONNOR.

"The properties of ammonium nitrate. Part VII. The reciprocal salt pair ammonium nitrate and sodium sulphate." By E. P. PERMAN and W. R. HARRISON.

"The mechanism of E. Fischer's synthesis of indoles and an example of the application of the method to the preparation of a pyrindole derivative." By G. M. ROBINSON and R. ROBINSON.

"Researches on residual affinity and co-ordination. Part XVII.

Stannic derivatives of β-diketones." By G. T. MORGAN and H. D. K. DREW.

"The activity of water in aqueous hydrochloric acid." By H. J. E. DOBSON and I. MASSON.

"A convenient form of a flask in organic chemical laboratories." By A. SHIMOMURA.

"Diphenyl series. Part I. Action of acid anhydrides on benzidine." By A. SHIMOMURA.

"The rhythmic crystallisation of undecoic acid." By W. E. GARNER and F. C. RANDALL.

"The velocity of oxidation of paraffin wax." By F. FRANCIS, etc.

ADDITIONS TO THE LIBRARY.

I. *Donations.*

COHEN, JULIUS BEREND. Organic chemistry for advanced students. 4th edition. 3 vols. London 1923. pp. viii + 424, viii + 462, viii + 412. ill. 54*s*. net. (*Recd.* 20/11/23.)
From the Publishers: Messrs. Edward Arnold & Co.

GUICHARD, MARCEL. Conférences sur les métaux. 3rd edition. Paris [1923]. pp. xxx + 356. ill. 30 *fr.* net. (*Recd.* 26/11/23.)
From the Publishers: MM. Gauthier-Villars et Cie.

INSTITUT POLYTECHNIQUE À IVANOVO-VOSNIESENSK. Bulletin. Vol. 4, etc., Ivanovo-Vosniesensk 1922 +. (*Reference.*) [In Russian.]
From the Institute.

KÜSTER, FRIEDRICH WILHELM, and THIEL, ALFRED. Lehrbuch der allgemeinen, physikalischen und theoretischen Chemie in elementarer Darstellung für Chemiker, Mediziner, Botaniker. Geologen und Mineralogen. Vol. II. Edited by ALFRED THIEL. Heidelberg 1923. pp. x + [758]. ill. (*Recd.* 3/12/23.)
From the Publisher: Herr Carl Winter

LUFF, BERNARD DUNSTAN WILKINSON. The chemistry of rubber. London 1923. pp. xii + 232. ill. 25*s*. net. (*Recd.* 15/11/23.)
From the Publishers: Messrs. Ernest Benn.

NICOL, E. W. L. Coke and its uses: in relation to smoke prevention and fuel economy. London 1923. pp. xii + 134. ill. 19*s*. 6*d*. net. (*Recd.* 30/11/23.)
From the Publishers: Messrs. Ernest Benn.

RECHENBERG, CARL VON. Einfache und fraktionierte Destillation in Theorie und Praxis. Miltitz bei Leipzig 1923. pp. xvi + 814. ill. (*Recd.* 3/12/23.)
From the Publishers: Herrn Schimmel & Co.